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ABSTRACT

Educational reform appears to be moving in two incompatible directions, exhibiting considerable interest in increasing freedom on one hand, but on the other emphasizing the control and management of the educational environment. The purpose of this research is to examine the conceptual impact of various psychological theories, particularly behaviorist ones, on freedom ideals in education. The method of the research is conceptual impact of various psychological theories, particularly behaviorist ones, on freedom ideals in education. The method of the research is conceptual analysis, and the basic argument is as follows: (1) there is no reason to assume that freedom ideals involve any antiscientific assumptions; (2) there is a logical connection between the concepts of freedom and reasoning such that a psychology which is unable to formulate an adequate concept of reasoning will also be unable to formulate an adequate concept of freedom; (3) most standard cognitivist psychologies have the requisite theoretical concepts in order to formulate an adequate concept of reasoning, however, this is not the case for many behaviorist psychologies; and (4) consequently, consistent application of behaviorist views to education situations may be expected to undermine legitimate freedom ideals in education. Conclusions are summarized for each section of the argument. A bibliography is included. (Author/KSM)

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FINAL REPORT

Project No. 1-0540B
Grant No. OEG 2- 71-0540

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THE CONCEPTUALIZATION OF FREEDOM IN PSYCHOLOGY AND EDUCATION

March, 1974

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ABSTRACT

The purpose of this research is to examine the conceptual impact of various psychological theories, particularly behaviorist ones, on freedom ideals in education. The method of the research is conceptual analysis. The basic argument is as follows:

1. There is no reason to assume that freedom ideals involve any anti-scientific assumptions.

2. There is a logical connection between the concepts of freedom and reasoning such that a psychology which is unable to formulate an adequate concept of reasoning will also be unable to formulate an adequate concept of freedom.

3. Most standard cognitivist psychologies have the requisite theoretical concepts in order to formulate an adequate concept of reasoning, however, this is not the case for many behaviorist psychologies.

4. As a consequence, consistent application of behaviorist views to educational situations may be expected to undermine legitimate freedom ideals in education.

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INTRODUCTION

Educational thought and educational innovation in the United States have been moving in what would appear to be two incompatible directions in recent years. For some programs the dominate concept has been freedom. There has been much interest in the free school and the open classroom. In such places freedom is valued as both end and means. The child is supposed to learn better when he is free, and often the end of the educational process is thought to be the liberation of the person. The unforgivable sin of such educational programs is excessive control or management of the child or the learning environment.

On the other hand, for many educational reformers it is precisely through systematic control or management of the child and the learning environment that educational success is supposed to occur. Exact and detailed specification of learning goals is emphasized. And in more behavioristically inclined views extensive management of the learning environment and of the child is lauded as the way of science and the only defensible path of progress.

The relations between these two paths of educational reform are puzzling. Are they compatible? They would appear to be organized around very different ideologies, as different as freedom is from control. And often the advocates of each type of education regard their views as incompatible with the other type. Freedom advocates talk about an emphasis on control as dehumanizing and may on occasion perceive hidden political and anti-democratic baises in educational programs emphasizing control. People who believe that efficient management of the educational environment is the way to succeed may write off freedom advocates as mystics, romantics, and anti-scientific.

Yet the incompatibility of the two viewpoints is not self-evident. Contrary to some critics, I suspect that most of the claims about freedom in education can be stated as testable empirical claims. Thus, it is inappropriate to dismiss them on the a priori grounds that they are unscientific in principle. Neither is it obvious that persons who talk about control and management need be anti-freedom. It is at least arguable that for some writers the apparent hostility to freedom values in education is more verbal than real, a matter of speaking a different language than of having different values. And often people who emphasize management of educational environments are merely noting that whatever our values or goals may be they will be accomplished under some conditions and not under others. That being the case it is necessary to state our goals explicitly in order to be able to decide when they have been accomplished and in order that we may create that sort of environment which enhances success. If this is what control or

management means in education, there is no reason why it should be objectionable to freedom advocates.

The central theoretical issue in this dispute or non-dispute (as the case may be) is the conceptual interaction between certain human ideals, particularly freedom, and the behavioral sciences. I have already mentioned that people who like to think in terms of control often dismiss freedom ideals as inherently anti-scientific. Even if this is wrong, it is reasonable to suppose that what the behavioral sciences tell us about man will influence our value concepts. Most human values have factual presuppositions without which they become implausible. Often these presuppositions concern human nature or the causes of human behavior. It is, then, naive to believe that our views about human nature or human behavior can change while leaving our value systems intact.

The purpose of this work is to investigate the conceptual interaction between freedom ideals and freedom concepts and some recent work in psychology and education. The results of this work should be illuminating with respect to how one understands the relations between the freedom model and the control model of education.

The body of this work will consist of three sections.

Section I explores the nature of the supposed conflict between freedom and the behavioral sciences. Various formulations of the problem are explored. It is argued that freedom values are not in principle anti-scientific, but that certain concepts are required in any theory which purports to explain human behavior if freedom values are to remain plausible. Specifically, a theory which renders freedom plausible must not exclude the possibility that men behave for reasons or on the basis of evidence, and it must be able to formulate the concept of what I shall call a reason-explanation.

Section II develops the concept of a reason-explanation. Part A examines the relations between logic and the psychology of thought or reasoning. It is argued that any psychology capable of formulating the concept of a reason-explanation must be willing to use some of the syntactical concepts of some logic in constructing its non-logical theoretical vocabulary. Part B compares some cognitive and some behaviorist theories of reasoning on their use of such concepts. It is argued that cognitive psychologies in fact do (or can) employ such concepts, but that certain methodological and theoretical commitments of behaviorism preclude a behaviorist theory of reasoning from formulating the necessary concepts. The consequence is the inability to formulate an adequate concept of freedom as well.

Section III explores the impact of a consistently applied behaviorism on educational programs. A theory of freedom in education is postulated and the effects of behaviorism on it are developed.

METHODS

This work is not an empirical study and thus does not have procedures in the sense of that term which is usually employed in discussing empirical research. Nevertheless, since the style of argument in what follows may be unfamiliar to many readers, it may be helpful to make a few brief observations concerning the assumptions underlying the kind of conceptual and a priori argumentation of this work.

Initially consider some facts about concepts. First, concepts change. What we mean by a certain term--how it is employed--may be quite different now than was the case a decade or a century ago. Second, there are often factual and logical assumptions which are presupposed by the fact that a certain concept has a given content and use. If our beliefs about these facts change, our concepts are likely to change as well. Finally, concepts function to organize thought and experience. People who approach the same set of phenomena with different concepts may organize the phenomena differently and in that sense will see different things. Indeed concepts often determine what can be thought and what will be seen.

The purpose of this work is to investigate some of the factual and logical assumptions which underlie various conceptions of freedom (particularly those which derive from various psychological theories) and to see how the resulting concepts function in the organization of educational phenomena. The assumption which underlies this investigation is that the theoretical positions which are currently extent in psychology will have an impact in the conceptualization of freedom or on concepts about freedom and that the resulting concepts will ultimately have an effect on how men perceive education, on what they perceive to be educationally worthwhile, and consequently on what they do.

It is to be noted that the process of conceptual change is often not a conscious process. It is quite possible that as the concepts employed by some psychological theory work their way into the speech habits of the common man they bring about a reorganization of his conceptual structure and point of view without any act of decision or even without any significant degree of awareness on his part. I suspect, for example, that this may have happened concerning the topic of abortion. A variety of developments in biology have effected the way in which men conceptualize the distinction between persons and things. They have made it less plausible to distinguish between men and non-men in terms of metaphysical or theological categories, that is in terms of whether or not the object under consideration for classification possesses a mind or soul, and have made it more plausible to make the distinction in functional terms.

Men can do things that non-men cannot. The consequence of this conceptual change is that the moral imperative "Thou shalt not kill," while it is not rejected, acquires a different meaning. A new way of distinguishing between persons and things makes it more plausible to classify a fetus as a thing rather than a person. "Thou shalt not kill" thus ceases to apply to abortion. One is no longer killing a person, he is disposing of unwanted tissue. A conceptual change alters how people see a moral issue, and there is no reason to assume that a person who has come to see abortion as something other than the killing of a human being will have any insight into the conceptual changes which have determined his moral intuitions.

Likewise concepts which we receive from psychology may very well influence what we perceive to be educationally worthwhile, and do so in an unconscious fashion. The concepts we employ to explain human behavior thus may have some conceptual by-products, some excess conceptual baggage. If we wish our values to be chosen by us rather than to happen to us, it is important to work out the details of what these conceptual by-products are like. This work is essentially an attempt to work out the details of the conceptual by-products of certain psychological theories for freedom values as exhibited in education.

SECTION I: The Conceptualization of Freedom

It is generally recognized by almost everyone who has thought about it that there is some kind of problem concerning the compatibility of psychology and human freedom. It is not, however, entirely obvious how the difficulty is to be understood. Is it the possibility of an explanation of behavior *per se* which seems to suggest that people are not free, or has the problem to do with the particular form of explanation or with the concepts involved in a given explanation?

I wish to identify three possibilities. That is, there seem to me to be essentially three ways in which the problem may be construed. I shall in what follows attend to each of these alternatives and attempt to provide some defense of the third. The alternatives are as follows:

1. The conflict turns on an issue concerning the *possibility* of the explanation of behavior. On this view it is held to be at least a necessary if not a sufficient condition of an act being free that it not have a sufficient explanation. The conflict between freedom and psychology thus concerns the very possibility of an explanation of behavior. Presumably psychology is supposed to provide explanations of human behavior. However, if an act is free only insofar as it is inexplicable, then psychology stakes out its subject matter at the expense of human freedom. To the extent that behavior is explicable, then people are not free.

2. The conflict turns on an issue about the *form* of explanation. It has been maintained by some philosophers that free acts are explicable, but they are not explicable in the same way that natural phenomena are explicable. It is not every explanation which is incompatible with freedom, only those of a causal or covering law form. Psychological explanations of behavior are incompatible with freedom only insofar as they involve explanations having a certain logical form. Other sorts of explanations are possible which do not have this form and which are compatible with human freedom. Here it is frequently the attempt to provide explanations of behavior on a model of explanation imported from the natural sciences which is considered problematic. Free acts are explicable, but not by explanations with the logical form common to explanations in the natural sciences.

3. The conflict turns on an issue about the vocabulary of explanation. On this view freedom is held to turn not on the logical form of an explanation of behavior, but on the kinds of concepts which are employed in such an explanation. Here as on the previous view an act is considered to be free when it has the proper kind of explanation, but by "proper kind" is meant not an explanation

with the proper logical form, but an explanation which employs the right kinds of explanatory concepts. Thus, any conflict between freedom and psychology will turn neither on the possibility of explanation, nor on the form of an explanation. If psychology poses a threat to the idea that men sometimes do free acts, it is because some psychologies involve the substitution of one sort of explanatory concept for another sort.

The first of these three views appears to be the common one, at least among psychologists. It is generally considered among those psychologists who have given any attention to the question that freedom is equivalent to or at least requires inexplicability. To claim that men are free is to claim that their behavior is capricious; that is, that it does not occur regularly under any specificable conditions. Skinner, for example, clearly exhibits such a view in Walden Two.

> "Isn't it time we talked about freedom?" I said. "We parted a day or so ago on an agreement to let the question of freedom ring. It's time to answer, don't you think?"
>
> "My answer is simple enough," said Frazier. "I deny that freedom exists at all. I must deny it--or my program would be absurd. You can't have a science about a subject matter which hops capriciously about. Perhaps we can never prove that man isn't free; it's an assumption. But the increasing success of a science of behavior makes it more and more plausible."[1]

He is somewhat more explicit about the matter in his latest work on the subject, Beyond Freedom and Dignity, where we read:

> Unable to understand how or why the person we see behaves as he does, we attribute his behavior to a person we cannot see, whose behavior we cannot explain either but about whom we are not inclined to ask questions. We probably adopt this strategy not so much because of any lack of interest or power but because of a longstanding conviction that for much of human behavior there are no relevant antecedents. The function of the inner man is to provide an explanation which will not be explained in turn. Explanation stops with him. He is not a mediator between past history and current behavior, he is a center from which

> behavior emanates. He initiates, originates, and creates, and in doing so he remains, as he was for the Greeks, divine. We say that he is autonomous--and, so far as a science of behavior is concerned, that means miraculous. The position is, of course, vulnerable. Autonomous man serves to explain only the things we are not yet able to explain in other ways. His existence depends upon our ignorance, and he naturally loses status as we come to know more about behavior.[2]

In this remark Skinner also links the view that men are free with the existence of an inner man, but even here the dominate characteristic of this inner man, the property which makes his acts free, is the inexplicability of his behavior. His behavior explains but is not itself explicable. The inner man acts without being acted upon. Thus, his behavior is miraculous, inexplicable, and, of course, places a limit on the possibility of a science of behavior.

Perhaps surprisingly one often finds this interpretation of freedom shared even by behavioral scientists who believe that man is free. It is not unusual, for example, to find references to Heisenberg's Indeterminacy Principle made with a view to showing that there is still a place for freedom in a scientific outlook. Presumably the point is that since it is conceivable in physics that some events occur which are not totally explicable, it is also conceivable (and scientifically respectable) that such events might occur in the domain of human behavior, and since such occurrences are possible, then it is possible that men are free.

Let us begin the discussion, then, by considering the relations between the concept of freedom and the concept of explanation. Perhaps another remark or two by Skinner will provide a suitable vehicle of analysis. In Science and Human Behavior Skinner claims:

> The hypothesis that man is not free is essential to the application of scientific method to the study of human behavior. The free inner man who is held responsible for the behavior of the external biological organism is only a prescientific substitute for the kinds of causes which are discovered in the course of a scientific analysis. All these alternative causes lie outside the individual. The biological substratum itself is determined by prior events in a genetic process. Other important events are found in the nonsocial

environment and in the culture of the individual in the broadest possible sense. These are the things which make the individual behave as he does. For them he is not responsible, and for them it is useless to praise or blame him. It does not matter that the individual may take it upon himself to control the variables of which his own behavior is a function or, in a broader sense, to engage in the design of his own culture. He does this only because he is the product of a culture which generates self-control or cultural design as a mode of behavior. The environment determines the individual even when he alters the environment.[3]

and again,

Science is more than the mere description of events as they occur. It is an attempt to discover order, to show that certain events stand in lawful relations to other events. No practical technology can be based upon science until such relations have been discovered. But order is not only a possible end product; it is a working assumption which must be adopted at the very start. We cannot apply the methods of science to a subject matter which is assumed to move about capriciously. Science not only describes, it predicts. It deals not only with the past but with the future. Nor is prediction the last word: to the extent that relevant conditions can be altered, or otherwise controlled, the future can be controlled. If we are to use the methods of science in the field of human affairs, we must assume that behavior is lawful and determined. We must expect to discover that what a man does is the result of specifiable conditions and that once these conditions have been discovered, we can anticipate and to some extent determine his actions.

This possibility is offensive to many people. It is opposed to a tradition of long standing which regards man as a free agent, whose behavior is the product, not of specifiable antecedent conditions, but of spontaneous inner changes of course.[4]

In these passages Skinner attempts to exhibit the view that men are free as an anti-scientific doctrine. It is to be noted initially that freedom is considered to be in conflict with science not because the idea that men are free conflicts with some generally accepted scientific facts in the way in which, for example, the concept of the ether conflicts with prevailing physical theory, but because the idea that men are free conflicts with Skinner's ideals of what science is like and what it is supposed to accomplish. Skinner seems to regard the concept of freedom as the conjunction of two doctrines. The first of these doctrines is that of the inner man. Behavior is held, according to Skinner's reading of the freedom doctrine, to be the product of the action of an indwelling agent. The second doctrine is the claim that the behavior of this inner man is itself inexplicable. The inner man behaves capriciously.

Such claims could in principle come into conflict with established scientific fact. That is, if we were in possession of a psychology which succeeded in providing a sufficient explanation of the range of human behavior with assumptions incompatible with the existence of a free inner man, then the two aforementioned doctrines would be shown false. While Skinner does on occasion make such extravagant claims about the existence of a science of behavior, his usual arguments against the view that men are free (the ones that deserve to be taken seriously) are developed in terms of considerations about the nature of adequate scientific explanation and adequate scientific procedure. The view that men are free comes into conflict with Skinner's philosophy of science long before his particular psychological theories become an issue.

The doctrine of the inner man seems basically to offend against what Skinner regards as an adequate theory of concept formation. According to Skinner, properties may be assigned to the inner man in an arbitrary fashion. The inner man may be given just those features which he needs to explain some behavior.

> The fictional nature of this form of inner cause is shown by the ease with which the mental process is discovered to have just the properties needed to account for the behavior. When a professor turns up in the wrong classroom or gives the wrong lecture, it is because his mind is, at least for the moment, absent. If he forgets to give a reading assignment, it is because it has slipped his mind. (A hint from the class may remind him of it). He begins to tell an old joke but pauses for a moment, and it is evident to everyone that he is trying to make up his mind whether or not he has already used the

> joke that term. His lectures grow more tedious with the years, and questions from the class confuse him more and more, because his mind is failing. What he says is often disorganized because his ideas are confused. He is occasionally unnecessarily emphatic because of the force of his ideas. When he repeats himself, it is because he has an idee fixe; and when he repeats what others have said, it is because he borrows ideas. Upon occasion there is nothing in what he says because he lacks ideas. In all this it is obvious that the mind and the ideas, together with their special characteristics, are being invented on the spot to provide spurious explanations. A science of behavior can hope to gain very little from so cavalier a practice. Since mental or psychic events are asserted to lack the dimensions of physical science, we have an additional reason for rejecting them.[5]

And since the inner man is not observable, there is no empirical check upon the properties assigned to him. Thus, attempts to use the inner man in explaining behavior are typically uninformative. They do not tell us anything about the observable conditions on which behavior depends, and they discourage us from looking for these conditions. At very best when the inner man is used to mediate between an observable antecedent and an observable consequent his appearance in an explanation is superfluous. When, however, the inner man replaces some environmental variable, his appearance in an explanation makes that explanation spurious since it places it beyond the domain of empirical objectivity. Adequate concepts in science require referents which one can see. The inner man seems to fall short of this methodological requirement.

The capriciousness of the inner man offends against the notion that the point of a science of behavior is to discover laws which explain and predict behavior. If the inner man acts without being acted on, then his behavior does not depend on any prior happenings and is thus neither explicable nor predictable. It is certainly not the proper object of a technological approach since what cannot be predicted or explained clearly cannot be controlled. If the inner man is free, then his behavior is not governed by laws. He is beyond the grasp of science.

Thus, the concept of freedom is anti-scientific on at least two counts. The idea that men are free offends against both the ideal that accounts of behavior should be subject to empirical confirmation and against the ideal

that science is supposed to discover the laws which explain phenomena. The demand that behavior should be explained by "external causes" expresses Skinner's own commitment on both of these points. To explain some behavior by an external cause is both to discover some law which will account for it and to formulate such a law as a relation between an observable antecedent and consequent. For Skinner, these ideals seem to virtually define scientific method and the scientific outlook. That some concept is incompatible with a scientific outlook is treated as sufficient for its refutation.

I shall treat the issues steming from Skinner's theory of concept formation at a later point. What is of interest to us here is Skinner's view that a free act has at least, as a necessary condition, the property of being inexplicable. We need now to inspect the concept of explanation and its relation to the concept of freedom.

Skinner does not, to my knowledge, provide an analysis of the concept of explanation which goes much beyond what could be gleaned from the above remarks. We may, however, proceed by sketching a rather common view of the matter which will serve nicely to illuminate the nature of the difficulty.

It is commonly held that to explain some event is to deduce that event from the conjunction of a covering law and a set of initial conditions. A covering law can be expressed as a hypothetical or conditional statement of the form, "If I then C", where "I" stands for some set of initial or antecedent conditions and where "C" stands for the consequent or the event to be explained. Initial conditions are expressed by some existential statement "I" which asserts that the initial conditions have actually occurred. An explanation of some event "C", therefore, has the following form:

If I then C
I
Therefore, C

The following features of this view of explanation are important. First, consider that "C," the description of the event to be explained, is a deductive consequence of the law and the assertion of initial conditions. This is a formal condition of the adequacy of an explanation for if "C" were not a deductive consequence of the law and initial conditions this would mean that the truth of the law and the occurrence of the initial condition is compatible with either the occurrence or the non-occurrence of the event to be explained. However, an explanation which is compatible with either the occurrence or the non-occurrence of the event explained is clearly not an adequate explanation. To explain an event on this view is to state the conditions under which it will occur, however, that being the case an adequate explanation of an event will entail its occurrence.

Second, on this view of explanation, explanation and prediction have the same logical form. That is, both an explanation of C and a prediction of C are a matter of deducing C from the conjunction of some law and some statement of initial conditions. The essential difference is the temporal relation to C. If the deduction of C occurs prior to the occurrence of C, then C is being predicted. If the occurrence of C is prior to the deduction of C, then C is being explained.

Finally, it will be convenient to refer to the kind of explanation described above as causal explanation and to the initial conditions specified in some law as the cause or causes of the consequent of the law.

The problem raised for the concept of freedom by this view of explanation can be expressed as a function of the universality of the hypothetical statement or law involved in such an explanation, or to put the point differently, as a function of the fact that in such an explanation the event explained is a deductive consequence of the explanation. A law asserts that if I occurs, then C will occur. If such a law is true, then it appears that if I occurs, then C is inevitable. C must occur.

When applied to behavior, this suggests that so far as an action is explicable, it is dependent for its occurrence on the occurrence of the appropriate antecedent events and that if these events occur, then the action must occur. However, it would seem to be of the essence of a free act that its occurrence is not rendered inevitable by the occurrence of some set of antecedent events. If one did A freely, then he did not have to do A. He could have done something else. But on the surface at least this would appear to indicate that A cannot be the consequent in any law which forms part of the explanation of A. If A were explained in such a manner, given the occurrence of the antecedent conditions, A would have to occur, but that would exclude A being a matter of free choice.

Since it is common in some circles to speak as though the problem of free will is a result of the encroachment of science into human affairs, it is perhaps appropriate to note that the difficulty expressed above was recognized many centuries ago and has less to do with the content of modern psychology than with the concept of explanation. Any view of explanation which holds that to explain an event is to point out regularities in nature connecting the event to be explained with antecedent events which determine it will give rise to the problem. In the first century B.C., the Roman poet, Lucretious, wrote

> Again, if all movement is always interconnected, the new arising from the old in a determinate order--if the atoms never swerve so as to originate some new movement that will snap the

> bonds of fate, the everlasting sequence of cause and effect--what is the source of the free will possessed by living things throughout the earth? What, I repeat, is the source of that will-power snatched from the fates, whereby we follow the path along which we are severally led by pleasure, swerving from the course at no set time or place but at the bidding of our own hearts?[6]

It is clear, I believe, that the logical structure of the problem which bothers Lucretius in this passage differs little from the logic of the conflict which Skinner points out between the view that men are free and the possibility of a science of behavior.

Skinner claims that if men were free, then their behavior would be capricious, inexplicable, and thus beyond the ken of science. We are now in a position to articulate some of the assumptions which are presupposed by such a claim. Let me note two such assumptions:

1. Skinner's views assume that it is at least a necessary condition of an act being free that it not have sufficient explanation of the covering law or causal form.

2. Skinner's views assume that such explanations which are held to be characteristic of explanation in the natural sciences are the only kind of explanations that there are.

It should be especially emphasized that while the first assumption is sufficient to place free acts beyond the scope of science (given usual interpretations of scientific explanation) both assumptions are required to justify the claim that free acts are capricious. For such a claim assumes not only that an act is not free if it can be explained by some covering law but also that there is not some other kind of explanation which is compatible with the freedom of the act explained. Both of these assumptions may be coherently denied. One may hold that while no act can be free and have a covering law explanation, it does not follow that such acts are capricious or that they are inexplicable. There are other kinds of explanations--kinds which do not carry the problems for freedom which follow from the covering law model.

Consider that it would be sufficient to establish one or the other of these conclusions (although it would not be apparent which of them) if it could be shown that there is reason to believe that free acts are explicable. If we could find a case which we could readily grant was both free and explicable, we could only conclude that either a covering law explanation did not disqualify an action from being free after all or that there was some other form of explanation which was appropriate to free acts.

I believe that in fact two sorts of arguments can be adduced which will support such a conclusion. Thus, I shall argue first that acts which seem paradigmatic of free acts are nevertheless both explicable and predictable and also that far from it being the case that inexplicability is required for freedom the inexplicability of an act entails that it is not free. It must be admitted initially that neither of these arguments entail the desired conclusion. If we find an act which while appearing paradigmatic of a free act is nevertheless found to be explicable, we may conclude that it was not free after all, and if we find that being inexplicable entails that an act is not free, we may conclude that since both being explicable and being inexplicable are incompatible with freedom, then necessarily people are not free. However, if we can show these two points, we will have made some progress toward establishing the plausibility of a different kind of analysis of the relations between the concepts of freedom and explanation than the one which was developed above.

To proceed, we shall first require some examples from which to select our paradigmatic free act. Consider the following three cases:

Case A: Mr. Jones is an employee of an automobile company. This particular automobile company is given to requiring its employees to buy its own cars and has been known to fire employees who buy cars from the competition. Mr. Jones is very afraid of losing his job. Therefore, he buys a new car from his own company every year.

Case B: Mr. Smith has a suitable car. However, lately Mr. Smith has been seeing a T.V. commercial where a certain new car is associated with a strong masculine character. Since Mr. Smith has an unconscious need to think of himself in these terms, he buys one of these cars. Smith is not aware of the actual explanation of his action.

Case C: Mr. Black needs a new car. While he is thinking about which car to buy he discovers a consumer publication which shows him that he can meet his needs most effectively by purchasing a small foreign car. Thus, he buys a small foreign car.

Consider some of the features of these examples. Case A and B suggest two ways in which an action can fail to be free. In the first case Jones is the victim of a kind of coercion. He is forced to do something that he would not otherwise do. When we are coerced to do something, then we are not free. In the second case the coercion (if it may be called coercion) is internal. Smith is not free because he is a victim of his unrecognized self-concept, one that has been created in him without his awareness or control. Smith has been the victim of a kind of psychological manipulation and is, therefore, not free. Case C seems paradigmatic of a free act. Black does what

there are good reasons for doing. His behavior is under his own control and is related to his genuine needs in a way which assumes a realistic assessment of how those needs may be met.

Each of these examples contains an explanation of the action. Each contains an answer to the question concerning why the act was done. In fact, we are inclined to treat A and B as not free and C as free, not because A and B have explanations while C does not, but because of the kind of explanations which they have. In addition, it is also the case that each of these actions was predictable. Anyone reasonably familiar with the general character and needs of Smith, Jones and Black might have made a reliable anticipation of what they would have done in such circumstances.

Let me put the point generally. It is simply not the case that we count the ability to provide an accurate explanation or prediction of some action as counting against its being free. Among the above examples, Case C provides a paradigmatic instance of an action which is explicable, predictable and free.

Indeed, I believe that the contrary is the case. Often we will count the inability of an individual to explain or predict his own behavior as a good reason for holding that it is not free. The concept of freedom has a logical connection with other concepts such as self control, the ability to relate behavior to one's needs, desires and beliefs about the world, and the ability to respond to the environment as evidence for what is appropriate in a given situation. But these are the things out of which explanations of acts are made. To be able to explain why one did something is to be able to indicate what needs the act served, what desires it fulfilled or what beliefs or situations it was done in response to. Thus, when a person is unable to predict what he will do or to account for what he has done, that is good reason to believe that he is not in control of his own actions. When a person's actions become a mystery to him and when they cease to have an intelligible relation to a person's wants, needs, beliefs and external circumstances, that is good reason to believe that they are not free. When a person cannot relate what he does to his wants needs and situation and when what he does is, so far as he is concerned, just something that happens, then he is a victim of his own behavior. When a man cannot explain what he does, then far from being free, he is in the most unenviable situation of being the servant of what from his point of view, are capricious events. That is certainly not freedom.

Of course, it does not follow from the fact that a person cannot explain what he does that what he does is inexplicable. We may ascribe such behavior to unknown causes. Indeed that would seem to be part of the general strategy of psychoanalytic explanations of behavior. They

render explicable behaviors which from the point of view of the agent, appear inexplicable. However, more to the point, the fact that an act is inexplicable does entail that the agent is not in control of it in the way which would seem requisite if the act is to be free. If an act is genuinely inexplicable, then it occurs independently of the agent's wants, beliefs of circumstances. If an act is inexplicable, then far from being free, it makes the doer its victim. This point has been made quite excellently by R. E. Hobart.

> Now, in so far as this "interposition of the self" is undetermined, the act is not its act, it does not issue from any concrete continuing self; it is born at the moment, of nothing, hence it expresses no quality; it bursts into being from no source. The self does not register its decree, for the decree is not the product of just that "it." The self does not rise up in its moral dignity, for dignity is the quality of an enduring being, influencing its actions, and therefore expressed by them, and that would be determination. In proportion as an act of volition starts of itself without cause it is exactly, so far as the freedom of the individual is concerned, as if it had been thrown into his mind from without--"suggested" to him--by a freakish demon. It is exactly like it in this respect, that in neither case does the volition arise from what the man is, cares for or feels allegiance to; it does not come out of him. In proportion as it is undetermined, it is just as if his legs should suddenly spring up and carry him off where he did not prefer to go. Far from constituting freedom, that would mean, in the exact measure in which it took place, the loss of freedom. It would be an interference, and an utterly uncontrollable interference, with his power of acting as he prefers. In fine, then, just so far as the volition is undetermined, the self can neither be praised nor blamed for it, since it is not the act of the self.[7]

If these arguments have any merit, they will have indicated that the way in which Skinner sets up the conflict between freedom and psychology is implausible.

Skinner's view requires a free act to be inexplicable and capricious. Psychology and freedom are in conflict because it is the task of a science of behavior to discover the laws which govern behavior, but free acts being capricious are not governed by laws. However, we have just seen that it is implausible to identify free acts with capricious or inexplicable behavior both because paradigm cases of free acts do not in fact have these qualities, but also because any act which did have such a quality could not be free. Thus, the tension between psychology and the view that men are free cannot be adequately treated as a simple dispute over whether or not behavior can be explained. Rather if there is a dispute between freedom and psychology, it must concern the question of how behavior is explained, not whether it is explained.

It is not clear, however, how we ought to understand the claim that the problem is a matter not of whether an act is explained but of how it is explained. I have suggested that there are two general ways in which this may be understood. First, it may be argued that the issue concerns the logical form of an explanation. Those explanations which account for free acts are not, on this view, of the covering law sort. It is perhaps noteworthy in this regard that Case C above is not obviously of the covering law form. At least it would be a matter of some difficulty to indicate what laws were mentioned or assumed in such an explanation. On the other hand it may be maintained that the sort of explanations which are typically provided of free acts are of the covering law sort and that what distinguishes these explanations from the explanations of acts which are not free is the kind of explanatory concepts employed. On the first alternative, the strategy will be to show that uncaused and inexplicable are not synonymous or, to put the point more directly, to exhibit the features of another view of explanation having features which distinguish it from the covering law model and which, therefore, avoid the difficulties which the covering law model raises for the concept of freedom. The strategy of the second alternative will be to show that whatever sorts of explanations are compatible with freedom are also capable of being analyzed on the covering law model.

I wish to consider two versions of the first thesis, the first of which stems from the views on explanation developed by philosophers strongly influenced by the work of Wittgenstein and the second of which stems from the Aristotelian tradition although it has many modern adherents.

The first view depends on two essential claims. First, it is held that there are two logically distinct and irreducible kinds of explanations which may be provided for human behavior, the causal model which is appropriate to bodily movements and what I shall call reason-explanations

which are appropriate to human actions. Second, it is held that the problem of free-will arises when we confuse the features of these two models, specifically when we treat cases of the second as though they were cases of the first. Let me look for a moment at the words of a proponent of this view, A. I. Melden.

On the first of these claims, Melden sums up his opinion as follows:

> ...it is a fundamental mistake to suppose that the causal model employed in the natural sciences will fit the everyday explanations of actions in terms of intentions, interests, desires, etc. It is not even our concern, in asking <u>how</u> someone did such and such, to inquire into the natural history of his action, to probe, as it were, behind the scene of human action itself, to discover events in an area that constitutes the general causal condition of action. In any case, whether the question is "Why?" or "How?", the concern is not with logically self-contained events which stand in some empirically discovered causal relation to one another, but with human events. It is hardly necessary at this point to inquire into the logical features of our descriptions of the character of persons. Their logical connection with action, the interests, desires, motives, habits, etc., of agents is surely evident. It follows that there is a radical disparity between these two modes of explanation: causal explanations of events and our familiar explanations of human actions.
>
> It is this radical disparity that accounts for the characteristic ambivalences and contradictions in current psychological discussions. Insofar as psychologists are obsessed with the desire to establish their inquiry on a parallel footing with the natural sciences, the search is on for mechanisms in terms of which explanations of conduct are to be given. Conduct viewed in this way becomes "overt behaviour", an ambiguous term that effectively obscures the all-important distinction between bodily movements or happenings and actions.[8]

First, consider some of the terms. Most importantly, this argument depends on making a distinction between actions and bodily movements. At the center of this distinction is the distinction between something I do and something which merely happens. A bodily movement, for example a muscle spasm, is something which happens to me. It is described in a rather different way than something that I do. Bodily movements, or what Hull calls colorless movements, are typically described in simple spatial temporal terms. To specify a bodily movement it is usually necessary to indicate the spatial change of some part of the body, although sometimes descriptions of things such as glandular secretions will also be in order. Actions on the other hand are things which I do. As such they are usually described in terms of their purposes or intentions rather than in terms of their physical properties. Generally, when someone asks us what we are doing, we will respond with a comment about the end we are trying to accomplish rather than a description of bodily changes of some sort.

On Melden's view, bodily movements are explained by causes. They are appropriate objects of the covering law model. On the other hand, actions are explained by reasons. They are explained by reference to the agent's intentions, motives and his beliefs about how these are to be achieved. Reasons, of course, are not causes.

We only begin to have a problem about the freedom of actions when we begin to confuse these two models. Again in Melden's words:

> Does the rejection of the causal model imply that actions are uncaused, that freedom is to be purchased at the expense of a capricious indeterminism, or of a libertarianism that misrepresents every responsible action as an heroic effort that somehow thwarts the causal order?" Quite the contrary, the argument is designed to show the logical incoherence involved in the supposition that actions, desires, intentions, etc., stand in causal relations, either in Humean sense or in any sense in which the term "causal" is employed in the natural sciences. And if the argument is correct, determinism, if it employs this sense of cause, is not false but radically confused. So it is with indeterminism and libertarianism which grant to determinism the intelligibility of employing the causal model--these seek to avoid the conclusion that each of us is the hapless victim of events, in the former case by

> viewing actions as causally indeterminate happenings, in the latter by viewing actions for which a person is responsible as events produced by extraordinary and mysterious self-exertions. The trouble in all these cases is that the applicability in principle of the causal model is taken for granted. Given this fatal blunder, actions degenerate into mere bodily happenings, produced or not as each of these doctrines would have it; and once this conceptual mistake has been made the way is open to a radical misunderstanding of desires, intentions, decisions, etc., as internal events that can operate in some sort of mechanism of the mind.[9]

Thus, as it turns out, on this view both determinism and indeterminism are features of the causal model of explanation. But on Melden's view actions are neither determined nor indeterminate because they are explained in a way which differs from the causal or covering law model. Thus, they are both free and explicable, but not determined.

Melden, then, holds that reasons explain action but do not cause it. If reasons are not causes, how do they explain? We may address this question by asking, What property of reasons for behaving makes them suspect as causes? The property which most clearly distinguishes reasons from the more usual sorts of causes is that it makes sense to ask for the justification of a reason for behaving where it does not similarly make sense to ask for the justification of a cause. The paradigm cases of reasons for behaving are motives and beliefs. It makes sense to ask of a motive if it is moral, and it makes sense to ask of a belief if it is true, but causes are neither true nor false, moral nor immoral. Thus, reasons are to be distinguished from causes in that reasons are appropriate objects of justification whereas causes are not.

This point should not be confused with a second. It always makes sense to ask about the justification of a causal explanation. If we suspect that Jones knocked Aunt Martha's vase on the floor and broke it because he had a muscle spasm in his arm at just the wrong moment, it is appropriate to inquire whether the sentence "Jones broke the vase because of a muscle spasm" is true, but having a muscle spasm is neither true nor false, moral nor immoral. However, if we believe that Jones broke the vase because he wanted the ugly thing out of his sight, then we can do more than ask if the explanation in question is true. We can also ask for the justification of the motive. We can ask if Jones ought to have wanted the destruction of Aunt

Martha's vase. It is this latter sort of question which we cannot ask of most causes.

This particular logical peculiarity of reasons has led some philosophers to put forward an argument to show that reasons are not causes and has also been the inspiration of an alternative account of the nature of reason-explanations. The argument proceeds as follows:

1. Reasons are objects of justification.
2. It does not make sense to ask for the justification of the cause of an event.
3. Reasons, therefore, are not causes.

The alternative account of how reasons explain is simple. To explain an action as having been done for certain reasons is not to give the causes of the action, but rather it is to provide the grounds or justification for the action. Such an account does not provide some antecedent event on which behavior is consequent; rather it provides a description of the circumstances, the rules, the values which warrant the action being explained. The alternative account, then, holds that the explanation of an action consists in its justification.

An account of motives which embodies these views is provided by A. R. Louch:

> The phrase "having a motive" does not imply that a person did, is now doing, will do, or has a disposition to do the act for which he has the motive. It implies rather that the situation in which the person finds himself would justify him acting in a certain way.
>
> .....
>
> .....when we ascribe a motive to agents it is not at all what we do when we speak of antecedent circumstances as the cause of events.[10]

In my opinion, this strategy for solving the problems of freedom and explanation fails. I shall argue both that the general strategy is contradictory and that the proposal for a non-covering law analysis of explanation can be shown to unworkable.

First, there is something very wrong with the notion that there are two different and logically irreducible models for the explanation of behavior. It is held that causes explain only movements and reasons explain only actions. But actions and movements are not mutually exclusive types of behavior, for rather obviously in most cases to do an action it is necessary that some movements occur. Thus, for most instances of behavior, there will be reasons which explain the actions and causes which explain the movements which constitute the action. But if reason-explanation and causal explanation are logically different

and irreducible, it becomes utterly mysterious how the necessary movements happen to occur just when we have reason for doing something. The fact that the muscles in my arm contract just when I want to raise it becomes explicable only by Divine intervention or pre-established harmony. In short, the reasons-explain-actions-and causes-explain-movements-dichotomy introduces a paradox into our comprehension of the human being. An adequate solution to the paradox seems to require that reasons be treated as causes, but once this move is made, the theoretical support of the Melden's view collapses.

This dilemma becomes even more acute if we try to apply the solution to the problem of freedom. Suppose we consider some candidate for a free act, let's say going to get a drink of water at the water cooler. On the view under consideration, this event is an action to be accounted for in terms of the agent's reasons for wanting a drink of water and is, therefore, a free act. However, it is fairly obvious that if a person is to get a drink of water, some set of bodily movements will have to occur. Arms, legs and lips will have to undergo some alteration of spatial coordinates. Now on Melden's view, the movements which comprised this action would be explained by causes, perhaps a physiological explanation would be in order, but the action would be explained by reasons. However, if this is the case, it would appear to follow that while the action was free since it has a reason-explanation, the constituent movements are determined since they have a causal explanation. We thus arrive at a rather paradoxical situation where we have a free action all of whose constituent movements are determined. It is strange that I can freely take a drink of water although my body presumably could not have executed any other set of movements than those which comprised taking the drink. Indeed, since the action and the movements are in some sense the same event and since Melden's view entails that the same event is both free and not free, the view is self-contradictory.

The explication of the alternative to a covering law model of explanation does not come off much better. I wish to show that both the argument against reasons being causes and the alternative account of reason-explanations rest on an ambiguity in the notion of a reason for behavior. Consider the following two sentences:

1. The reason John goes to church is that he believes in God.
2. John's reason for going to church is that God exists.

The crucial point in the argument to show that reasons are causes is to note that the referent of the word "reason" is different in these two sentences. To make this clear, let us express John's believing in God as a relation between an agent, John, and a proposition, "God exists."

The referent of the word "reason" in sentence (1) is the relation. It is John's believing which explains his going to church. However, the referent of the term in the second sentence is the relatum, the proposition which John believes. If John were asked to justify his going to church, part of such a justification might include the claim that God exists.

The act of believing and the proposition believed have quite different properties. It is the believing which explains John's behavior; however, believing is neither true nor false. On the other hand, the proposition believed does not explain John's behavior. The proposition is, however, either true or false. Thus, if true, it may constitute part of the grounds for going to church. At the same time, the proposition is itself an object of justification.

Given these facts, what shall we say of our argument and our alternative account of reason-explanation? The argument to show that reasons are not causes is either trivial, invalid, or it contains a false premise. If the referent of the term "reason" in the first premise and the conclusion is held to be the proposition believed, then the argument is valid and its premises are true, but it is trivial for it has the force of showing that propositions are not causes. That, however, is not interesting for propositions do not explain at all. Thus, the argument, interpreted in this fashion implies nothing at all about reason-explanation. If the referent of the term "reason" is the act of believing, then, although the argument is valid, the first premise is false. An act of believing is not an object of justification in the proper sense since it is neither true nor false. Finally, if the referent of the term "reason" is the proposition believed in its use in the first premises, but is the act of believing when it occurs in the conclusion, then the argument is invalid since it equivocates on a crucial term. In none of these cases does the argument succeed in proving that reasons for behaving are not causes of behavior.

The alternative account of reason-explanation does not fare any better. It is simply false that the justification of an act explains it. It is, after all, perfectly conceivable that a person might be entitled or obligated to a course of action but, nevertheless, fail to do it. However, an explanation which is compatible with the non-occurrence of the event explained obviously fails. People do not act because an act is justified, but because they believe that it is justified. However, then it is the believing that explains, not the fact that the act is warranted. Further, the term "reason" in the sense which functions in explanations of behavior refers to the proper sort of thing to be a cause of behavior. It refers to mental states, acts of believing and wanting. These can be

taken as states of persons, and states of persons are the right sorts of things to be antecedent factors on which behavior is consequent.

It is important to see that my objection to the view under consideration has two distinct aspects. First, I have held that the account fails because it provides no antecedent on which the action is consequent. It is not the fact that the act is justified which explains it, but the fact that the agent believes that it is justified as well as the fact that the agent is disposed to do what he believes it is reasonable to do. By making action dependent on mental states such as motives and beliefs as well as dispositions to behave rationally we restore plausible antecedent conditions on which behavior is consequent. Second, I have claimed that the alternative account fails because as expressed the truth of the explanation (the fact that a certain act is justified) is compatible with the non-occurrence of the act explained. This violates a logical condition for the adequacy of any explanation. To construct a reason-explanation which actually explains, we shall have to use a model of the following form.

1. Any agent who wants W and believes B, does A (other things being equal)
2. Agent X wants W and believes B (other things being equal)
3. Agent X does A.

The force of the qualifying expression "other things being equal" is to indicate that not all of the initial conditions on which action A is consequent are known. However, what this model of explanation does is to construct reason-explanations on the covering law model. It is to be noted that two of the defects found in the alternative understanding of reason-explanations stem from a departure from the covering law model. First, the model failed to provide a set of initial or antecedent conditions on which the behavior in question was consequent, and second, the alternative failed to suggest that the action in question was universally dependent on such conditions. It should be clear at this point that any explanation which fails to assert such a universal connection between antecedent and consequent will have the defect of the truth of the explanation being compatible with the non-occurrence of the event explained. To correct these deficiencies is to construe reasons as causes.

(A parenthetical remark on the concept of universality may be of help here. Let me distinguish between universality and generality. I shall call a statement asserting a connection between antecedent and consequent universal if it asserts that whenever the antecedent occurs, the consequent will occur. I shall call such a statement general if it covers a large number of instances. It is clear that a statement can be universal but not general. A state-

ment of the form "If I then C" may be true even if it has only one or indeed no instances. It will not be general under such conditions. As I have developed the matter, the covering law model of explanation requires only universality, not generality. It is thus not susceptible to objections which claim that reason-explanations are not of the covering law form because they are not general.)

The reader should be clear at this point that the conclusion of these arguments is not that the distinction between reason-explanations and other sorts of explanations is not of considerable import to the solution of the freedom problem. The conclusion is that however reason-explanations differ from other kinds of explanations, it is not in terms of their logical form. Reason-explanations seem to share the covering law form of explanation with those sorts of explanations common in the natural sciences.

We still have a second instance of the attempt to find a non-covering law type of explanation for free acts to consider. Let us turn to what I shall call the Aristotelian view.

I shall discuss the Aristotelian view or what is sometimes called the notion of agent causality in a version developed by Roderick Chisholm in an article entitled "Freedom and Action." I have selected this article both because it is a competent defense of the view and because it is developed in such a way as to render it a convenient vehicle of discussion.

On Chisholm's opinion if an act is determined by other events, then it is not free; however, if an event is indeterminate, it is not free either. Thus, the problem for Chisholm is to discover some third alternative, a way in which an action can be explicable, but not determined. Chisholm suggests the general features of his strategy as follows:

> We must not say that every event involved in the act is caused by some other event and we must not say that the act is something that is not caused at all. The possibility that remains, therefore, is this: We should say that at least one of the events that are involved in the act is caused, not by any other events, but by something else instead. And this something else can only be the agent--the man. If there is an event that is caused, not by other events, but by the man, then there are some events involved in the act that are not caused by other events. But if the event in question is caused by the man,

> then it is caused and we are not committed to saying that there is something involved in the act that is not caused at all.[11]

Free acts are those which are done by the man, by an agent. At the level of ordinary language, one can hardly disagree. However, Chisholm is obviously doing more than saying that free acts are those which a man does rather than those which happen to him. The idea that free acts are those done by a man is for Chisholm a technical philosophical position. We have to ask, then, "What is it for an act to be caused by an agent?" The previous passage will provide the first clue. Events are determined when they are caused by other events. That being the case if we are to find an act which is caused, but not determined, then it must be caused but not caused by some antecedent event. Thus, a distinguishing feature of agent causality is the idea that when an agent causes an act, he does this without doing anything; that is, the agent's causing an act does not consist in the occurrence of some antecedent event on which the action is consequent. Chisholm makes this clear in a passage which at the same time develops some vocabulary for the further discussion of the issue.

> I shall borrow a pair of medieval terms, using them, perhaps, in a way that is slightly different from that for which they were originally intended. I shall say that when one event or state of affairs (or set of events or states of affairs) causes some other event or state of affairs, then we have an instance of transeunt causation. And I shall say that when an agent, as distinguished from an event, causes an event or state of affairs, then we have an instance of immanent causation.
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> The nature of what is intended by the expression "immanent causation" may be illustrated by this sentence from Aristotle's Physics. "Thus, a staff moves a stone, and is moved by a hand, which is moved by a man." (VII, 5, 256a, 6-8). If the man was responsible, then we have in this illustration a number of instances of causation--most of them transeunt, but at least one of them immanent. What the staff did to the stone was an instance of transeunt causation, and thus we may describe it as a relation between events: "The motivation of the staff caused the motion of the stone." And similarly for what the hand

did to the staff: "the motion of the hand caused the motion of the staff." And, as we know from physiology, there are still other events which caused the motion of the hand. Hence we need not introduce the agent at this particular point, as Aristotle does--we need not, though we may. We may say that the hand was moved by the man, but we may also say that the motion of the hand was caused by the motion of certain muscles; and we may say that the motion of the muscles was caused by certain events that took place within the brain. But some event, and presumably one of those that took place within the brain, was caused by the agent and not by any other events.[12]

Thus, it is the fact that the agent is a kind of unmoved mover, that agents produce acts without doing anything in order to do so, which enables us to explicate a view of freedom which avoids the twin dilemmas of determinism and indeterminism. Or does it? Chisholm points up one obvious objection himself.

> But now: if, when the agent A happen, there was no event involved other than A itself, no event which could be described as making A happen, what did the agent's causation consist of? What, for example, is the difference between A's just happening, and the agent's causing A to happen? We cannot attribute the difference to any event that took place within the agent. And so far as the event A itself is concerned, there would seem to be no discernible difference--no discernible difference between A just happening and the agent causing A to happen. Thus Aristotle said that the activity of the prime mover is nothing in addition to the motion that it produces, and Suarez said that "the action is in reality nothing but the effect as it flows from the agent." Must we conclude, then, that there is no more to the man's action in causing event A than there is to the event A's happening by itself? Here we would seem to have a distinction without a difference--in which case we have failed to find a via media between a deterministic and an indeterministic view of action.[13]

Chisholm's response here is that whatever the solution to the problem may be (he does not suggest one), the dilemma is solvable, for it is not a problem solely for immanent causation, but is a problem for the concept of causation generally. Thus, unless one is ready to dispense with the concept of causation entirely, he cannot regard the objection as insurmountable. It seems that although we may not know what the solution is, we can be reasonably sure that there is one.

Chisholm's argument, therefore, consists in claiming that the problem at issue is a problem for transeunt causation as well.

> For the problem, as we put it, referring just to "immanent causation," or causation by an agent, was this: "What is the difference between saying, of an event A, that A just happened and saying that someone caused A to happen?" The analogous problem, which holds for "transeunt causation," or causation by an event, is this: "what is the difference between saying, of two events A and B, that B happened and then A happened, and saying that B's happening was the cause of A's happening?" And the only answer that one can give is this--that in the one case the agent was the cause of A's happening, and in the other case event B was the cause of A's happening. The nature of transeunt causation is no more clear than is that of immanent causation. In short, as long as we talk about causation at all (and we cannot avoid it) the difficulty is one that we will have on our hands. It is not a difficulty that is peculiar, therefore, to our treatment of the problem of freedom.[14]

This is not a satisfactory response and the reasons why it is not a satisfactory response reveal insurmountable difficulties for the concept of immanent causation. Consider initially that there are some notable differences between "B happened and then A happened" and "B caused A." For one, the latter entails "If B, then A (other things remaining equal)" whereas the former does not. Chisholm might, of course, say the same thing about immanent causation although it is not obvious what he would put into the antecedent slot. I suppose he might say that if the agent were to cause A again, then A would occur, other things remaining equal. But this is not adequate. Chisholm's point in claiming that there are analogous difficulties for transeunt causation to those indicated for

immanent causation appears to be that it is not more obvious how the occurrence of B produces the occurrence of A than it is how agents produce actions. But suppose that we admit this. Suppose that we grant that we do not understand how to explicate what is involved in B's power to bring about A just as we do not understand the agents power to produce an act. Suppose we even grant as Chisholm argues later that our understanding of transeunt causation is in some way derivative on our understanding of our own capacity to produce action. There is a further difficulty for immanent causation.

The similarity between immanent and transeunt causation consists in the fact that in neither case can we explain the nature of the dependence of the event explained on what explains them. The disanalogy consists in the fact that the doctrine of immanent causality cannot even provide a coherent account of what the event to be explained depends on. That is obviously not a problem for transeunt causation. Suppose we compare the following cases: There is a rather obvious difference between the sentence "B happened and A happened" and the sentence "A happened;" namely, the occurrence of B. But what is the difference between "Agent X did A" and "A happened." Here there is not an obvious difference, for agent X's doing A does not seem to consist in the occurrence of any event or in anything else for that matter. Indeed, the connection between the act A and agent X is indeterminate in the sense that A does not ex hypothesi depend on any changing properties of X. But what is it then that explains A? Let us not concern ourselves with how agent's cause actions and admit that this is a problem for transeunt causation as well. But what is it that actions explained by immanent causation are explained by? The answer Chisholm's view seems to require is Nothing!

Suppose action A to have occurred at time t_2 and let us further suppose (for the sake of the simplicity of the necessary symbolism) that causes are simultaneous with their effects. Now let us ask, "What is it about agent X at time t_2 which differed from agent X at time t_1 which accounts for the fact that A occurred at t_2 rather than t_1; Two answers are possible. We may say that the difference between X and t_1 and t_2 was that at t_2 X had property P but at t_1 X did not have property P, or we may say that there was no difference. Either A depends on some change of X or it does not. Chisholm cannot be satisfied with either response. If he claims that some difference about X from t_1 to t_2 accounted for A, then A is explained by the occurrence of an antecedent event and, thus, we do not have a case of immanent causation and A is determined and, therefore, not free. On the other hand, on the latter response the relation between the occurrence of A at t_2 and X is accidental, that is X does not explain A at t_2.

(Obviously such an argument could be constructed for the non-temporal properties of A as well.) The conclusion is that either A is determined or it is indeterminate and, therefore, that Chisholm has failed to provide a middle ground for freedom to inhabit.

(In my opinion, although I shall not argue it, the source of Chisholm's difficulty is the fact that "determined" and "indeterminate" are contradictory terms. Either an event is regularly conjoined with the occurrence of other events, or it is not. Insofar as it is so related to other events, then it is determined. Insofar as it is not so related to other events, then it is indeterminate. The failure of both of these "non-deterministic" accounts of the explanation of behavior to explain anything supports this contention although it does not entail it. However, if I am right, obviously all attempts to discover some non-deterministic form of explanation are doomed to failure in that they are in effect attempts to discover a third alternative to A and not A.)

An additional problem with Chisholm's view deserves mention. Chisholm's view does not avoid many of the objections to an indeterminist analysis of freedom. His view is superior to a rather naive indeterminist view in that since the agent causes his behavior, his behavior cannot be regarded as merely capricious from the agent's point of view. Chisholm's agent will not be a victim of capricious bodily occurrences since he does them. But if the agent's behavior will not be capricious in relation to the agent, the agent and his behavior will be capricious in relation to the agent's environment, and this would, I suspect, include not only the external environment, but also the agent's "psychological environment," his motives, intentions, beliefs and character.

On Chisholm's view it is clear that the chain of explanation ends with the agent. That is, the agent's action is not itself dependent of the occurrence of any further events. At worst, this means that the agent's choice is unrelated to the agent's motives, desires, beliefs and character and to the agent's external environment. We have already indicated why this is objectionable. At best, the problem which Chisholm's theory was meant to solve merely recurs at a different level. Supposing Chisholm's account of immanent causality to have succeeded in providing a non-deterministic account of the relations between agents and their acts, we shall now require a non-deterministic account of the relations between the agent's motives, beliefs and external situations and whatever it is that agents do (or don't do) when they cause behavior. ONly here the distinction between immanent and transeunt causation will not help since manifestly motives, beliefs and external circumstances have the quality of being events.

They come and go. They change. Thus, they are not suitable for the role of unmoved mover.

An analogue of this last objection to Chisholm's view provides an easy transition to a consideration of the third class of views on freedom, those which treat freedom as concerning how an action is caused. In what follows I shall argue the following claims: (1) that there is a logical connection between the concepts of freedom and reason, (2) that the concept of agent causality makes the connection between freedom and reason contingent rather than logical, and (3) that this difficulty may be overcome by a view which treats free acts as those acts which have the proper kind of causal explanation, a reason-explanation.

Several facts can be noted which indicate the logical connection between freedom and reason. Each of the following indicate that rationality is a logically necessary condition of freedom, that is, that "not rational implies not free" is a logical fact about the concept of freedom.

This conceptual fact is marked first in that it is normally considered that, to the degree that a person is mentally ill, he is neither free nor is he responsible for what he does. The acts of a psychotic person are in that sense no acts at all. They are things that happen to him. Thus, he is not considered responsible for them. On the assumption that the distinction between the normal person and the psychotic is made in part in terms of the individual's capacity for rational behavior, this seems a clear indication that there is a connection between the concept of reason and the concept of freedom.

The existence of this sort of connection is born out in much psychological and sociological theory. Consider, for example, the conceptual impact of the thesis of a book such as Freud's Psychopathology of Everyday Life. Here Freud argues that the reasons which people provide to explain their normal everyday behavior are often not an adequate account of this behavior. There are, Freud tells us, often unconscious causes for a varied assortment of errors and mistakes. When applied to errors and mistakes, this is a fairly innocuous thesis. When we say that some act was a mistake of the sort involved in a slip of the tongue or an unintentional error, we already imply that it was not something we did, but rather was something that happened to us. Mistakes of this type ex hynothesi are not free acts. Note, however, what happens when explanations of this sort are applied to other categories of behavior. Suppose, for example, that I have done action A and that I claim that I did A for reasons R. Now suppose that some Freudian explains to me that in fact R is not why I did A. Actually, I did A because of some set of unconscious events. First, it seems to follow that my reasons were, in fact, merely rationalizations, i.e., they do not explain

what I did, but are themselves phenomena in need of explanation. More interesting, however, is the fact that when my reasons for A are seen to be rationalizations and when A is instead explained by some unconscious mechanism, A turns out to be something which happened to me rather than something I did. A is no longer something chosen by me and, thus, is no longer a free act.

A similar process can be observed to occur in certain interpretations of aspects of Marxist sociology. The slogan "ideology is a function of class" suggests that the reasons people give to explain why they believe what they believe do not in fact explain their beliefs and that the explanation of their beliefs is more appropriately looked for among certain economic variables, particularly economic class. Again, it seems to immediately follow that any belief so explained becomes something which happened to a person rather than something which he chose to do. When a man's sincerely expressed reasons for what he believes or does turn out not to actually explain his behavior, he becomes a victim rather than an agent and thus can no longer be considered to have acted freely.

The principle which seems to be assumed in the above illustrations can be stated succinctly as follows: When for some action, A, a non-reason explanation is substituted for a reason-explanation, A becomes transformed into something which has happened to a person, rather than something which he has done and, thus, ceases to be free. The suggestion is that the concepts of a reason, reasoning, and a reason-explanation are most important in explicating the concept of agency and the notion of human freedom. It also seems to follow that the tendency of a variety of psychological theories to substitute causal explanations for reason-explanations is a most fruitful phenomenon to examine.

There are a number of other analogous cases where the concept of reason seems to mark the difference between a kind of freedom and a kind of "unfreedom." Some such cases are of particular importance in education. Consider, for example, that the distinction between being persuaded and being indoctrinated seems to mark the distinction between autonomous belief and manipulated belief. To persuade is to provide evidence. When a person arrives at some belief as the result of having considered available evidence, we are willing to say that he has made up his own mind, and by that we appear to mean something to the effect that he is active with respect to the contents of his own mind, that he is a free agent with respect to his beliefs. When a person is indoctrinated, however, he is gotten to believe something apart from any rational form of persuasion. Note that the shift into the passive in the previous sentence seems quite appropriate and is virtually required when we begin to talk about a person having been indoctrinated. The suggestion is that when a person is indoctrinated, his

beliefs are not something that he chooses, rather, they are something which is done to him. He does not change his mind, he undergoes a change of mind. He is not free or autonomous with respect to his own processes of thought.

Here, again, we seem to have a fairly clear case where the distinction between what a person does, his free acts, and what happens to him exhibits some sort of conceptual link to the concept of reasoning. It seems as though, even with respect to one's own mental life, to be free is to be rational, whereas when one is not rational, he also turns out not to have been free. I would suggest that implicit in facts such as these, one can find reasons to support the following notions.

1. There is a conceptual link between concepts such as 'reason,' 'reasoning' and 'reason-explanation' on one hand, and concepts such as 'freedom' and 'agency' on the other.

2. Central to the notion of a free action is that such an action must have the right sort of explanation.

3. We tend to treat behavior as free or as having been done by an agent when it is or could have been explained by reasons and not otherwise.

The concept of agent causality, however, seems incompatible with this logical connection between freedom and reason. To make this point, I wish to engage in a critique of an article entitled "Autonomy: A New Paradigm for Research," by Leonard I. Krimerman published in the 1972 N.S.S.E. Yearbook. Krimerman's treatment of autonomy is, as he notes, dependent on the concept of agent causality.[15] His view of freedom is essentially that of Chisholm.

Professor Krimerman's basic task is to argue against what he calls the Incompatibility Dogma. The Incompatibility Dogma concerns the relation between autonomy and determinism. It holds that, since determinism is a basic assumption of scientific inquiry and since determinism and autonomy are incompatible, freedom and science are at odds. In Krimerman's words according to the Incompatibility Dogma, "one can take seriously either free choice or scientific inquiry, but not both."[16] Krimerman believes the incompatibility doctrine to be false. His strategy is to show that there are kinds of explanations which while they give a kind of account of free actions, do not involve subsuming free acts under covering laws. His views, thus, fall in the second class of views on the relation between science and freedom.

An essential part of Krimerman's argument involves developing a distinction between autonomous and non-autonomous actions which he seems to me to do quite successfully. I am, however, of the opinion that his explication of the distinction between autonomous and non-autonomous action is incompatible with the alternatives he develops to

the Incompatibility Dogma. (It should be clear that I agree with Krimerman that what he calls Incompatibility Dogma is false, but I shall try to show that it is false on grounds other than the ones he provides.)

First, let me develop Krimerman's alternative to the Incompatibility Dogma. Krimerman's position may be put as follows: If the Incompatibility Dogma is true, then it must be the case that the statement "A is free" entails the statement "A is inexplicable." However, it is not the case that 'A is free' entails 'A is inexplicable.' This is not the case and since there are at least two sorts of explanations of which autonomous actions are susceptible, and since autonomous acts are susceptible of these two sorts of explanation, the Incompatibility Dogma is false.

The first of these two sorts of explanation involves what Krimerman calls Enabling Conditions. It is Krimerman's opinion that while if an action is autonomous it may not be explicable by a covering law which states sufficient conditions for its occurrence, nevertheless, there are conditions which Krimerman names Obstacles which precludes the possibility of autonomous action. Enabling Conditions are events which overcome Obstacles. Thus, these are laws of the form "Enabling Conditions cause the elimination of obstacles which makes action possible." ($E\ C \rightarrow \sim O \rightarrow \Diamond A$) What is interesting about laws of this form is that the consequent is not the action A but the possibility of action A. That the consequent is the possibility of A marks the fact that the free choice of the agent is necessary for A to occur. That a choice or act of an agent is what makes A occur is what makes A autonomous.

The second class of explanations involves what Krimerman calls Range Extending Factors. Range Extending Factors result in more options for action. Laws involving Range Extending Factors, like laws involving Enabling Conditions, are anti-deterministic. They explain only the possibility of action. Thus, they do not state sufficient conditions under which an action must occur. And they fail to state sufficient conditions because there are none, since the actions which they explain are autonomous.

One must carefully avoid the illusion that these explanations explain action. They do not. Rather, they explain the possibility of action. The action itself is explained by an appeal to agent causality. I suppose that since for an action to occur it must be possible, there is a sense in which the explanation of the possibility of some action is also partial explanation of its occurrence. But it is crucial to keep in mind that Krimerman's view maintains the notion that an autonomous action is not determined in the sense that there is no set of antecedent events which are sufficient for its occurrence. There is, then, no covering law which sufficiently explains a free act. Since

in my opinion it is this part of Krimerman's view which is mistaken, my argument will be more successful if the reader does not lose sight of the fact that Krimerman maintains an anti-deterministic analysis of freedom, one clearly akin to Chisholm's view.

I can now express my point of contention with Krimerman. Krimerman's objection to the Incompatibility Dogma rests on the following two claims:

1. It is at least a necessary condition of an autonomous action that it not be deducible from a covering law and a set of initial conditions. Put more simply, a free act must involve an element of indeterminacy.
2. It does not follow from the truth of (1) that there are no empirical conditions or laws which can be discovered which govern the possibility of autonomous actions.

Krimerman's rejection of the Incompatibility Dogma rests on (2). I find his argument here convincing. Thus, the Incompatibility Dogma is successfully laid to rest. However, I think that (1) is false. Thus, I shall argue against Krimerman that the question of the autonomy of an action turns not on whether it is caused, but on how it is caused. That is, I shall try to show that freedom and determinism are compatible and that free acts are those with a certain sort of causal history.

Let me look at Krimerman's argument for (1). Krimerman claims that should we discover a covering law or sufficient condition explanation of an action, this would show that the agent would have acted as he did "regardless of what he desired or believed or that he was unable to alter his desires and/or beliefs ."[17] It follows from this that no such action could be autonomous. This argument may be expressed schematically as follows:

1. If determinism is true, then for any action either
   a. the agent would have acted as he did regardless of his motives or beliefs, or
   b. the agent would be unable to alter his motives or beliefs.
2. Both (a) and (b) are incompatible with autonomy.
3. Therefore, any action which is determined is not free.

I shall show that neither (a) nor (b) is a consequent of determinism. If my argument is successful, then there will be no reason found remaining in Krimerman's argument to show that autonomy and determinism are incompatible.

To show that it does not follow that a determined act would occur regardless of the agent's motives and/or beliefs, it is sufficient to note that the agent's motives and beliefs may be among the determinants of his actions. If one holds that actions are often explained by covering laws of the form, "Motives and Beliefs cause Action" $(M \cdot B \longrightarrow A)$, then it clearly does not follow that the action so explained will occur regardless of what is wanted or believed. In fact, quite the opposite follows.

Neither does it follow from determinism that an agent must be unable to alter his motives and beliefs. Consider that agents often change their motives and beliefs in ways that are perfectly explicable. Most interestingly, they occasionally change their motives and beliefs because they are presented with evidence which persuades them that their desires are undesirable or that their beliefs are false. It is not inconceivable that such explanations can be analyzed in terms of the covering law model and, if this is true, then determinism does not involve a commitment to the unalterability of motives or beliefs.

It is here that I suspect that Krimerman will cry "Foul." He might say, "It is not my claim that determinism entails that motives and beliefs do not change. It is my claim that determinism entails that agents do not change their motives and beliefs. These are not obviously equivalent. Further, what Strike's argument shows (if anything) is that there are conditions which may determine a change in an agent's motives and beliefs, but what autonomy requires is that the agent change his motives and beliefs. This is what determinism precludes."

We have now unearthed an issue which cannot be successfully resolved in this project. It is true that I have assumed that an agent's motives and beliefs changing as the result of evidence and a process of evaluation is what it is for the agent to change his motives and beliefs. (I would not incidentally say the same about the changes in motives and beliefs effected by "non-rational" causes.) What I shall attempt instead is to show that some of the criteria developed by Krimerman to distinguish autonomous and non-autonomous acts come very close to presupposing such a view.

Krimerman makes this distinction as follows: In order to be autonomous an action must be both purposeful and voluntary. Purposeful acts are those done for motives and beliefs. But since some motives and beliefs may themselves be held non-autonomously, and since a purposeful action done because of non-autonomous motives and beliefs is not autonomous, the analysis of autonomy requires that criteria be specified by which we may identify autonomous motives and beliefs.

Krimerman lists six such criteria for the notion of autonomous belief varying them only slightly for motives.

It will serve my purposes to quote parts of four of these. A man's belief P is autonomous when:

(a) He understands P, in the sense that he can explain its sense to others, know when it would be true or false...

(b) He has in some way tested P...

(c) He does not change his....belief in P when extraneous rewards for believing it are either increased or decreased.

(d) He relinquishes or decreases his belief in P when relevant counter-evidence is presented...[18]

It is important to note that these criteria of autonomous belief support the position that there is a logical connection between freedom and reason. A belief for which one knows when it would be true or false, that one has tested, or that one gives up when given counterevidence, is a belief that is held and abandoned for reasons rather than a belief which receives a non-rational sort of explanation.

Indeed, it is crucial to my argument to see that these criteria assume two things.

1. They assume that the choice of an autonomous motive or belief is explicable. These criteria concern how people come to have, maintain, or give up beliefs. Those kinds of things are explanations.

2. They assume that autonomous beliefs have one sort of explanation and not another. Generally, the assumption seems to be that autonomous beliefs are those explained by reasons. Beliefs explained in other ways are not autonomous.

Now we are at a point where the dilemma in Krimerman's argument can be brought into focus. His rejection of the Incompatibility Dogma keeps intact the assumption that the absence of a sufficient covering law explanation is an essential property of autonomous belief or action. The Incompatibility Dogma is false largely because it overextends the consequences of this indeterminacy. But Krimerman's criteria of autonomous beliefs involve different assumptions. They assume that autonomous beliefs or acts are explicable and, moreover, that such acts are autonomous because of the way they are explained. To state the dilemma succinctly, at one point Krimerman holds that acts are autonomous because they are inexplicable while at another point he assumes that they are autonomous because of the way they are explained. I would like to opt for the second alternative.

I can imagine two responses to my argument here. First, Krimerman might claim that although autonomous acts are explicable they are not explicable by covering laws. Reason-explanations are not causal explanations, so the argument goes. We have already found reasons to reject this view. The second and more interesting way out is to hold that such explanations as may be provided of motives and beliefs are of the same logical type as those involving Enabling Conditions or Range Extending Factors. They are non-determining. (Indeed, Krimerman might well want to treat reasoning as a Range Extending Factor.) They may suggest choices to the agent, enlarge his options, increase his perspective on his choice, but the choice is still the free, undetermined choice of the agent. As the traditional version of this doctrine goes, "Reason inclines, but it does not necessitate."

Here again, I would respond that this way out is incompatible with Krimerman's criteria of autonomous belief. Krimerman's criteria make reasoning or evaluating essential to the concept of autonomy (that is presumably why they are called 'criteria'). Autonomous acts are those explained by reasons. But to treat such explanations as of the same logical type as those involving Enabling Conditions or Range Extending Factors makes reasoning accidental to the concept of autonomy, substituting instead the undetermined acts of a mysterious agent as the crucial element in the analysis. Krimerman still seems to be presented with a choice between his anti-deterministic position and his criteria of autonomous belief.

It seems that we can solve this problem only by retreating to the position that an autonomous belief (or act) is one that has a certain sort of causal history, namely it has a reason-explanation. The Chisholm-Krimerman analysis of freedom entails the mistaken view that the connection between freedom and reason is contingent and must, therefore, be rejected. Further, we have given reasons why a retreat to the position that reason-explanations are of a different logical type than causal explanations, is untenable. The alternative which remains is to hold (1) that autonomous acts are those which have reason-explanations and (2) that reason-explanations are a kind of causal explanation. In short we have found some support for a view of freedom of the third type suggested in the opening pages of this section. It turns out that whether or not an act is free or autonomous depends not on whether it is explained, nor on the form of explanation given, but on whether the concepts employed in a causal explanation of the act are such as to render the explanation a reason-explanation. Additional support for this position is found in the fact that at one point arguments designed to show that no act having a true covering law explanation can be free have been found unsuccessful.

In order to make a solid case for these two views about autonomy it would be necessary to incorporate them into a systematic analysis of autonomy. I do not, however, intend to do this since it is sufficient for my purposes to have shown that rationality is a conceptually necessary feature of freedom and to have indicated the plausibility of the view that such a position is compatible with the position that free acts can be explained by covering laws. To attempt a detailed analysis of autonomy at this point would take us far afield. Instead here we need to notice the consequences of this position for the original question concerning the conflict between psychology and freedom.

The reader will recall that we began by exhibiting three possibilities on this issue.

1. The conflict turns on an issue concerning the possibility of the explanation of behavior.

2. The conflict turns on an issue about the form of explanation.
3. The conflict turns on an issue about the vocabulary of explanation.

My argument locates the real conflict in the third area. I have held that free or autonomous actions have explanations of the sort I have termed "reason-explanations" and that this is not an issue of the form of an explanation. In fact it is an issue about the kinds of concepts used in an explanation. Reason-explanations employ a kind of vocabulary that is not found on other types of causal explanations. What follows is that the attitude that a psychology has toward human freedom ought to be directly related to the willingness of that psychology to provide reason-explanations for behavior. To the degree that a psychology refuses to employ reason-explanations it will entail that men are not autonomous.

Clearly, then, if we are to proceed we must accomplish two tasks. First, we must be more explicit on what is meant by a reason-explanation. Further progress will be slight if the term continues to be employed in the rather intuitive fashion that it has been used to this point. Second, we need to see how various psychologies treat the concept of a reason-explanation. Having done this we will be able to better see what impact psychology might have for the understanding of freedom ideals in education. Parts A and B of Section II will be concerned respectively with these questions.

SECTION II: In Psychology

A. Logic and Thinking

A central issue in explicating the concept of a reason-explanation concerns the relations between logic and psychology.

At first blush it seems intuitively obvious that logic and the psychology of cognition or thought have something to do with each other. Thinking is often described as logical or illogical. Logic in some way seems to define what counts as good thinking. Nevertheless, once we get beyond such platitudes and truisms about logical thought, it becomes very difficult to decide just what are the relations between logic and psychology. In this Section, I shall develop and defend two theses about the relations between logic and the process of thought. I shall show: (1) that logic provides the criteria according to which thought is evaluated, and (2) that thinking must be thought of as the "embodiment" of logical rules. Further, I shall argue that the truth of (1) requires the truth of (2). It is the second of these claims which seems to me to be the most interesting given the nature of this enterprise, since it seems to me both that, if it is true, it places certain constraints on the process of concept formation in cognitive psychology, and also that, if it is denied, important consequences follow for the understanding of concepts such as reason, freedom, and agent.

Let me begin by scrutinizing the claim that logic is the laws of thought. One can find remarks to this effect in the preface of a number of logic texts, and in one notable case the phrase provided the title for a fairly influential work on the subject of logic. Thus, George Boole entitled his contribution to the development of probability theory, An Investigation of the Laws of Thought, on which are Founded the Mathematical Theories of Logic and Probability. What does the claim that logic is the laws of thought mean? Is there any sense in which it can be defended?

First, it should be noted that there are two ways in which the phrase can be misleading. Consider the word "law." Sometimes "law" refers to a regularity, some connection between occurrences. In other cases, the term denotes a regulation, something which prescribes or forbids behavior. In neither sense does the word "law" provide an adequate term by means of which to characterize the relations between logic and psychology. If we are to hold that logic is the laws of thought in the first sense, the effect is to make logic into a branch of psychology. Logic turns out to specify the laws which describe the ways in which a certain set of events, thinking, happen. The laws of logic on such a view would relate to thought in the same way that f=ma relates to motion. Clearly, for reasons which will be sketched shortly, such a view is inadequate.

To interpret the word law as referring to a regulation, while a more adequate view, is still less than satisfactory. The difficulty with regarding logic as a set of regulations or rules is the implication that the claims of logic are conventions in the sense that they are objects of human decision. Laws, after all, are creations of human beings. They are made, not discovered. Even social rules or customs, while they may not in fact have been decided on by anyone and may be perceived by the members of a culture as quite objective and quite real, objects of discovery not invention, may, nevertheless, be identified by men as conventions and changed. However, the subject matter of logic is not a matter of convention, at least not in any very simple way. However, we may account for the fact, it is clear that the claims of logic have an objective status, that the propositions of logic are discoveries not inventions. Thus, it would make no more sense to call an assembly to decide on whether to repeal Modus Ponens than it would to introduce a bill in Congress to repeal f=ma. Indeed, the deficiency of the word law, in both of its senses when used to describe logical relations, is that it tends to cast aspersions on the objectivity of logical relations, in the first case by making them dependent of the working of the human mind, and in the second case by suggesting that they are conventions, objects of decision rather than discovery. It will, in the course of the development of my argument, be convenient to speak of logical laws or rules. It is important, however, that the regulative connotations of such terms be maintained without the suggestion that logic is a matter of convention or of psychology. If logic deals with rules, it discovers them. It does not invent them.

Having claimed that logic is not a part of psychology, but that, nevertheless, logic and thought have something to do with each other, it might be well to suggest how logic and psychology differ. Presumably, it is the primary task of psychology to explain behavior. To adequately characterize the enterprise of psychology, it is undoubtedly necessary to show how the kinds of behavior it explains differ from the behavior which is the province of sociologists on one hand or biologists on the other. Fortunately, it is not necessary for us to do that, however, since the property of psychology which sets it off from logic is basically that it does seek to explain.

Psychology performs this task of explaining behavior by seeking to discover laws which describe regularities in behavioral events and (as exhibited in enlightened practitioners) by constructing theories from which these laws can be deduced. The way in which such explanations are confirmed provides the first clue to the reason why one wants to hold that logic is not a branch of psychology. Laws assert that certain relations between some set of

generically characterized events universally hold. Laws we say are generalizations. That being the case, laws are held to be true when they accurately state the relations which obtain between the phenomena. If one is able to find some counter instance, some case where the law in question does not accurately formulate the relations between events, that is reason to consider the law false. But then, if logical rules were taken to be laws in the sense of law which has to do with the explanation of events, they must be generalizations about what people do. They must be laws which account for processes of thought. However, if that were the case, the standard rules of logic would be shown to be false by every piece of poor reasoning; or to put the point a different way, the notion of poor reasoning would disappear for what would follow from the discrepancy between actual thought and some logical rule would not be that the thought was mistaken, but that the rule was in error. If the adequacy of logical rules is determined by actual processes of reasoning, obviously one cannot judge such processes to be mistaken according to these logical rules. Thus, it is quite clear that one cannot regard logic to be laws of thought in any sense which takes logical rules to be some sort of empirical law.

There is, however, a somewhat more sophisticated form of psychologism which avoids such difficulties. It might be held that although, obviously, people make logical errors, nevertheless, they are under some psychological compulsion to find some argument forms valid and others invalid. Mistakes arise not because logical rules are not descriptions of the operations or structures of the human mind, but because the logical form of a particular argument is not always obvious. People are under some sort of psychological compulsion to find certain logical rules valid; indeed, it is this compulsion which determines validity, but it does not follow that mistakes are impossible or that logical rules merely formulate actually observed processes of reasoning. It is the case, however, that logic is what it is because the mind is what it is, and that the nature of the mind has explanatory force in accounting for what people do in evaluating arguments.

While this view is not as obviously mistaken as is the case with the primitive version of psychologism described above, it is still unacceptable. What we need to ask ourselves here is whether we are prepared to treat any set of facts about how people actually think as having any bearing on the truth or falsity of logical propositions. Suppose, for example, that some anthropologist located some remote tribe whose members were all disposed to find $p \supset q$, q, therefore, p a valid argument, would we be inclined to treat this psychological fact as evidence for the validity of the argument? Or suppose, as the result of some mutation, a group of people came into existence who found p and $\sim p$ to be not in the least problematic, would we conclude

that the laws of logic were different for them? The obvious negative answer to these questions suggest that how people in fact happen to think has very little to do with logical truth.

To note the obvious difficulties in regarding logic as a part of psychology does not, however, take us very far in discovering what logic and psychology have to do with each other. It merely eliminates a mistaken view. Perhaps a more fruitful approach might be to begin by seeing how logicians have come to understand their own discipline. Consider, for example, the following remarks by Irving Copi in the Introduction to his Symbolic Logic.

> Logic has frequently been defined as the science of reasoning. That definition, although it gives a clue to the nature of logic, is not quite accurate. Reasoning is that special kind of thinking called inferring, it is not the special province of logic, but part of the psychologist's subject matter as well....The logician is not interested in the actual process of reasoning. He is concerned with the correctness of the completed process...
>
> The logician is not concerned with the process of reasoning, but with the propositions that are the initial and end points of that process, and the relations between them.[19]

The above remarks exhibit what seems to me to be a characteristic ambivalence in the writings of logicians on their own subject. First, one finds an expression of the central orthodoxy of formalist logicians; the subject matter of logic is the validity of arguments. Logic is concerned with arguments, the results of thought, not with thought itself. Nevertheless, logic is in some way a guide to thinking. It seems that logic must have something to say not only about what good arguments are like, but about what good thinking is like. Let me try to give a more explicit form to the ambivalence by distinguishing between what I shall call strict formalism and moderate formalism. Consider the following two claims.

1. Logic provides standards for determining the validity of arguments.
2. Logic provides standards for determining the correctness or adequacy of actual processes of thought.

Strict formalism may, then, be defined as any position which holds (1) but denies (2). Moderate formalism may be defined as any view which holds both (1) and (2). Given this set of categories, Copi seems to be a moderate formalist. It is my purpose in the next several pages to defend

moderate formalism and to try to see what sort of view of thinking it requires.

Moderate formalism seems (at least to my intuitions) to be sufficiently more plausible than strict formalism that it might be best to conduct the inquiry by asking why anyone would deny it. The response is, I believe, that moderate formalism has been thought by some philosophers to have the smell of psychologism. Carnap, for example, has written:

> ....logic is often characterized as the art of thinking, and the principles of logic are called principles or laws of thought. These and similar formulations refer to thinking and hence are of a subjectivist nature.[20]

Note that in this passage it is the mere use of a mental term which is held to be objectionable in discussions concerning logic. Such terms are objectionable, in Carnap's view, because they detract from the objectivity of logic. It is clear that the effect of a prohibition against the use of mental vocabulary in such contexts is incompatible with moderate formalism. Indeed, in the above passage it is precisely what I have called moderate formalism which is being objected to.

Carnap proceeds to distinguish what he calls primitive psychologism from a less objectionable view which he calls qualified psychologism. Primitive psychologism is the view which I have criticized above. It takes logic to be an extension of psychology. Qualified psychologism seems to be essentially what I (seeking a less pejorative label for my own view) have called moderate formalism. Carnap's indictment of qualified psychologism is not as severe as the initial quote might lead one to believe. Having distinguished it from primitive psychologism, he remarks that:

> ...they say that logic is concerned with correct or rational thinking. Thus, they might explain the relation of logical consequence as meaning: "If somebody has sufficient reasons to believe in the premise i, then the same reasons justify likewise his belief in the conclusion j." It seems to me that psychologism thus diluted has virtually lost its content; the word 'thinking' or 'believing' is still there, but its use seems gratuitous.[21]

Presumably, the reference to thinking or believing is gratuitous because it suggests that the point of logic is to say something about correctly relating mental states to one another, or that its purpose is to tell us how to perform an activity, thinking, correctly, whereas in fact, the

point of logic is to characterize what counts as a valid argument. However, the view is merely gratuitous instead of false because people who say such things generally hold that whether one belief justifies another turns on the relations between propositions, not on the relations between mental states.

If I may again translate Carnap into my categories, the above remarks may be construed as holding that moderate formalism is not mistaken, rather it is vacuous in that proposition (2) does not add anything to proposition (1). But this seems to me to be in error. What proposition (2) adds to proposition (1) is the claim that logic can and does function to guide a certain sort of activity, thinking. It is more than just a tool to evaluate the product of thought; it is also a tool by means of which the process may be evaluated. We need to see if there is any reason to accept or reject such a view.

Carnap's argument, assuming it to be an argument against moderate formalism and in favor of strict formalism, can be objected to on two grounds. First, it is inappropriate to regard the view that logic has something to say about how we ought to think as a form of psychologism. The defining property of psychologism is that it holds that the validity of arguments is in some way dependent on how human beings actually think. However, there is no trace of this view in what I have called moderate formalism or in what Carnap calls qualified psychologism. Thus, the label is misapplied. There is only one respect in which moderate formalism could be thought to imply that actual processes of thought might have any bearing on the conclusions of logic. It might be held that the view that logic should guide thought places pragmatic constraints on the work of logicians. It might be held to be a criterion of an adequate logic that it be capable of performing such a function, and it is conceivable that some existing logics could be found wanting perhaps because of their abstractness or counterintuitiveness, in terms of such a position. But even should one hold such a position, the charge of psychologism would not be warranted, for such a view would amount to the claim that an adequate logic must meet other criteria than formal validity. Pragmatic criteria are to be employed as well. While such a claim may be incorrect, it is not psychologistic. It does not assert that there is any respect in which the validity of an argument is dependent on human psychology.

The most serious objection to Carnap's view has been expressed in general terms by Stephen Toulmin. Objecting to Carnap's view, Toulmin writes,

> ....a characterization of logic in terms of justified beliefs, actions, policies, and so on is unavoidable. For if logic is to have any application

> to the practical assessment of arguments and conclusions, these references are bound to come in.[22]

The most obvious way to argue Toulmin's case is to note that it is generally possible to use logical rules to evaluate not only the product of thought, but the process as well. This is not a mere restatement of the desired conclusion. It is to point out that Carnap's remarks seem to be incompatible with the quite standard practice of assessing thinking according to logical rules and standards For example, on Carnap's view, how are we to understand concepts such as correctly inferring and making logical errors? It seems that on Carnap's view we will have to treat these concepts as having to do with the products of thought, not the process. Correct inferences and mistakes will turn out to be solely the properties of arguments. But it is paradoxical, to say the least, to suggest that there is something wrong with talking about people making inferences or making mistakes. However, once we admit the appropriateness of such concepts, we will also have to admit that it is appropriate to consider logic as an instrument for evaluating what people do as well as what they have produced, for it is logic which tells us what is to count as correct or as a mistake in reasoning. Carnap's view seems almost to require that there are inferences but not acts called inferring or that there are mistakes but not acts which are the making of mistakes. Even more strangely, Carnap's view seems to suggest that there are justified conclusions, but not justified beliefs.

It is doubtful, of course, that Carnap meant to deny that people perform inferences or that they are sometimes correctly described as making mistakes. But, if this is the case, then it is difficult to see why he should find the notion that logic comprises the laws of thought to be objectionable, for it is hard to see why this sort of claim should be taken to mean any more than that the rules of logic may be used to assess the process of thinking, as well as the products of thought.

It is worth noting that Carnap's view has two sides, both of which are rather undesirable. The first side, which we have just examined, is that logic cannot be used to guide behavior. The second side is that Carnap's view contributes to the trend in psychology to try to understand thinking without addressing the question as to how people make inferences. Carnap's view is the other side of the coin of mechanistic psychologies of cognition, psychologies which treat reasoning as something other than the performing of logical operations.

If the reader has been persuaded that it is not inappropriate to think of logic as the laws of thought in the sense that logical rules may be taken as governing not only the validity of arguments but also providing the criteria

according to which a certain activity, thinking or reasoning, may be evaluated, then the question which needs to be addressed is how it is that this is possible. What view of thinking is required if it is to be the sort of thing which can be assessed by logical rules?

Perhaps the most obvious thing to say in response to this question is that reasoning must be understood as a rule-following activity where the rules in question are those of logic. It has at this point become almost a philosophical truism that a condition of ascribing such terms as "correct" or "mistaken" to an activity is that it be construed to be the following of some rules. Thus, just as we must refer to the rules of chess to decide if a man has castled correctly, we must also appeal to the rules of logic to see if a person has thought correctly.

One might conceive the relation between thought and logic to be analogous to the relation between language and syntax. Indeed, this would be more than an analogy since, in fact, reasoning is a kind of linguistic activity and logical rules are a kind of syntax. Thus, the question of the relation of logic and the psychology of reasoning is likely a special case of the question of the relation between grammar and the psychology of language, and the role of logic in theory construction in this psychology of thought will be a special case of the role of syntax in theory construction in the psychology of language.

Interesting as such analogies may be, I do not believe that merely to say that reasoning must be conceived as the following of logical rules tells us much more than that logical rules may be used to evaluate the activity called thought. It is not clear, for example, what we say when we call some activity A rule-following beyond the fact that there are rules which specify how A should and should not be performed. That does not tell us what the activity must be like in order for it to be evaluable in such a way.

A more adequate response to the question of how logic is able to regulate thought may be made by suggesting that a process of thought be conceived as an "embodied argument." This point may be stated initially as one concerning the proper vocabulary for the description of thinking. It requires that any vocabulary which is adequate to describe the activity of thinking must contain descriptive terms which are constructed out of the standard vocabulary of logical discourse. This may be made clearer by means of an example.

Let us suppose that there is some person Jones, and let us suppose that at time t_1 Jones believes p and believes that $p \supset q$ but does not believe q. However, at t_2 Jones also believes q. Let us further suppose that we may correctly account for Jones believing q at t_2 by holding that Jones inferred that q from p and $p \supset q$ by Modus Ponens at

some time between t_1 and t_2. Here we have a paradigm case of a process of reasoning and a reasonable illustration of the way in which processes of reasoning may be said to embody arguments.

Consider the vocabulary by means of which this explanation is constructed. First, we have a set of terms which refer to mental states. They are 'believes p,' 'believes q,' and 'believes $p \supset q$.' Second, we have a phrase which describes the processes whereby the last of these three beliefs resulted from the conjunction of the other two, "inferred by Modus Ponens."

It is, of course, immediately obvious that in this case these descriptive phrases are constructed, in part, of some terms from the propositional calculus. The individual beliefs are individuated and thus identified by the propositions of which they are the believing, and the action whereby Jones got from two of these beliefs to the third is individuated and thus identified by means of a particular rule of inference, Modus Ponens. Thus, the non-logical vocabulary by means of which processes of reasoning are described is generated by using the vocabulary by means of which arguments are described to individuate mental states and processes. It is in this sense that processes of reasoning may be taken to be the embodiment of arguments.

The above is not, of course, entirely based on a description of the features of ordinary language discourse about thought. Obviously, belief statements as characterized above form a large part of our normal descriptions of thinking, but one does have to look up a logic class to find a phrase like "inferred by Modus Ponens," and certainly, we do not have in the language any phrase like "Modus Ponensing." Generally, we make do with less specific descriptions of logical operations like "infer" or "deduce," although it is understood that more specific descriptive phrases may be constructed by adding to the phrase "inferred by" the name of some rule of inference. Generally, such events are rare since the language-using community has not learned any very precise set of categories for distinguishing rules of inference. Neither is there in ordinary language any very precise mistake vocabulary although, interestingly, ordinary language mistake vocabulary seems a bit more discriminating than "correct inference" vocabulary. Thus, such mistake words as begging the question and ad hominum, if not exactly what one would expect to hear on the street corner, are widely used among the non-philosophical, educated community.

What is important to my argument is to recognize that whether or not a vocabulary for describing different kinds of logical operations is in wide use, it is always possible to construct such a vocabulary, and use it to describe not only permitted logical transformations, but also to describe what people do when they think.

The relation between a logical operator and a mental act which I have called embodiment is a key notion here and requires further elaboration. Perhaps some discussion of a portion of Piaget's work will serve this end.

In the Psychology of Intelligence Piaget writes:

> In any expression, such as $(x^2 + y = z - u)$, each term refers to a specific action: the sign (=) expresses a possible substitution, the sign (+) a combination, the sign (-) a separation, the square (x^2) the action of reproducing 'x' x times, and each of the values u, x, y and z the action of reproducing unity a certain number of times. So each of these symbols refers to an action which could be realised, but which mathematical language contents itself with describing abstractly in the form of internalised actions, i.e. operations of thought.[23]

This view is surely incorrect and seems implicitly psychologistic. Let us consider for a moment the claim that the term '+' stands for a mental act or an operation of thought. The difficulties of treating the symbol '+' as the name of an overt action of putting together are well known. Frege, in the classical expression of the objection writes:

> MILL understands the symbol + in such a way that it will serve to express the relation between the parts of a physical body or of a heap and the whole body or heap; but such is not the sense of that symbol. That if we pour 2 unit volumes of liquid into 5 unit volumes of liquid we shall have 7 unit volumes of liquid, is not the meaning of the proposition $5 + 2 = 7$, but an application of it, which only holds good provided that no alteration of the volume occurs as a result, say, of some chemical reaction. MILL always confuses the applications that can be made of an arithmetical proposition, which often are physical and do presuppose observed facts, with the pure mathematical proposition itself. The plus symbol can certainly look in many applications, as though it corresponded to a process of heaping up; but that is not its meaning; for in other applications there can be no

> question of heaps or aggregates, or of the relationship between a physical body and its parts, as for example when we calculate about numbers of events. No doubt we can speak even here of "parts": but then we are using the word not in the physical or geometrical sense, but in its logical sense, as we do when we speak of tyrannicides as a part of murder as a whole. This is a matter of logical subordination. And in the same way addition too does not in general correspond to any physical relationship. It follows that the general laws of addition cannot, for their part, be laws of nature.[24]

So '+' cannot denote the physical act of combination. Piaget does not, however, say that '+' denotes an overt act but a mental one, an act presumably done on numbers or signs. Does this make a difference?

First, it must be remembered that Piaget regards thought as in some sense internalized action. It seems then that we shall have to consider the mental act supposedly denoted by the '+' as a kind of internalization of the physical act of combining. If that is the case, then Frege's objections would appear to hold. There is also another objection. If the sign '+' stands for a mental act, then what the expression 2 + 2 = 4 asserts is that the consequence of performing the mental act addition on the numbers 2 and 2 is that one obtains the number 4. That, however, is clearly an incorrect view of the proposition. Such an analysis entails both that 2 + 2 = 4 is an empirical claim and also that it is an empirical claim about the operation of minds. Both are highly objectionable. The latter consequence has already been discussed at length. Neither is there any point in devoting space toward showing that arithmetical propositions are not empirical claims. Almost all of the work in the foundations of mathematics in this century stands as a testimony to that fact. The classical arguments can again be found in Frege.

(Piaget apparently does not intend these psychologistic consequences. At one point he claims:

> Symbolic logic need not have recourse to psychology, since a question of fact in no way affects a hypothetico-deductive theory. Conversely, it would be absurd to invoke symbolic logic to settle an experimental question such as that of the actual mechanism of intelligence.[25]

Here Piaget seems to hold that the validity of arguments is independent of any factual claims including psychological

ones. This is, I believe, correct, however, this view of the nature of the referents of logical and mathematical operators entails the opposite conclusion.)

Again the central problem is that while the proposition 2 + 2 = 4 is a necessary truth (usually considered to be an analytic proposition) and thus is true not only independently of psychological facts, but of any factual claims whatsoever, Piaget's claim that mathematical and logical operators stand for mental acts has the force of entailing that 2 + 2 = 4 asserts that a certain mental act performed on a set of mental entities (numbers are apparently mental entities for Piaget) has the consequence of producing a further mental entity, the number 4. We must recognize, however, that while 2 + 2 = 4 most certainly does not mean this, there is a corresponding psychological statement to the effect that when people add 2 and 2 they get 4 which is an empirical claim which is conceivably false and which in some cases is in fact false.

Piaget's dilemma seems to be that he has failed to adequately distinguish these two different claims or to put the point concretely that he has not distinguished the word "+" which denotes a logical or mathematical relation from the word 'add' which denotes a mental act. Here I believe is the crux of the problem. An adequate solution to the question of the relation of logic to psychology must recognize that logical terms such as "+" and mental terms such as 'add' have different referents. It must also recognize that an understanding of the mental act of addition is dependent on an understanding of the arithmetical relation denoted by '+'. If '+' denotes a kind of relation between arithmetical entities, then "add" is the mental act of formulating or conceiving that relationship. By formulate or conceive, I do not mean an act performed on arithmetical entities (such as to physically do something with them so as to produce a certain effect, e.g., that they equal a certain sum). Again 2 + 2 = 4 must be considered a fact which is true independent of any mental act. On the other hand, neither do I mean by formulate any appeal to some sort of faculty of intuition whereby the relation existing in some sort of abstract mathematical entity is merely apprehended. Adding is not a kind of seeing done with the mind's eye. Rather, in Piaget's terms adding is an operation. It is something the mind does with concepts of numbers. It is the act of relating numerical concepts according to the rules governing addition. If one likes, for these purposes, the "+" can be thought of as the name for a set of instructions which specify what is to be done. The truth of an arithmetical proposition depends on the formal properties of the rules involved. Mental operations are the act of following such rules. The formal properties of the arithmetical rules are the standard of appeal whereby one decides if the operation was performed correctly and

that the answer is correct. What actually takes place in the mental operation is the psychological question. This is, of course, something to be decided independently of the formal properties of the logic being employed.

If my argument here is correct, then the conception of mental acts or operations of reasoning as the embodiments of logical rules has the following virtues.

1. It suggests a general way of conceiving and describing a wide range of cognitive activities. These activities are appropriately thought of as rule-following and they may be described by means of a vocabulary constructed out of the names of the rules being followed.

2. It is at least suggestive of a way that the psychology of reasoning can escape the twin evils of appeals to intuition on the one hand and mechanistic accounts on the other.

3. It suggests (more here shortly) how logic and psychology may be related without either psychologizing our logic or lapsing into a priori psychology. On this view the truth of logical propositions remains independent of psychological facts, and the truth of psychological facts and theories remains an empirical matter.

It is necessary that thinking be describable in this way if logic is to be employed in evaluating thinking. If thoughts are embodied arguments, then logic, in virtue of being the science of valid argument, is also the science of correct thought. If thought is conceived in some other way, it is not clear how logic will get a handle on it. Suppose we imagine some alternative vocabularies for describing thought. To do this let us consider some alternative ways of explaining Jones believing q. Suppose we understand this such that we take it as our task to explain some utterance q or the disposition to utter q. And then suppose we construct an account of such a disposition in terms of the individual's history of reinforcement. Consider, for example, some cases of this sort from B. F. Skinner. At one point Skinner claims that "We build 'belief' when we increase the probability of action by reinforcing behavior."[26] Or in Verbal Behavior one finds the following account of what Skinner thinks himself to be doing to the reader.

> I have, as it were, put the reader through a set of exercises for the express purpose of strengthening a particular verbal repertoire. Stating the matter in the most selfish light, I have been trying to get the reader to behave verbally as I behave.[27]

There is more to say about Skinner than these excerpts would suggest, but should we content ourselves with describing thought in terms of categories such as reinforcement or strengthening verbal repertoires, we will wind up with a view of thought such that thought can no longer be

evaluated according to logical rules, for what sense will we be able to give to concepts like correct or mistaken when we are dealing with a series of events described in mechanistic terms and related to each other only by causal laws. Can a history of reinforcement be characterized as correct, or what sense would it make to describe some reinforcement schedule as begging the question? Much the same sort of thing might be said of some account of thought described in terms of a sequence of neurological states. Such sequences of events are simply not the right sorts of things to be logically correct or logically out of order. They do not embody arguments. Indeed, any such series of events so described (supposing the description to have been intended as an explanation of thinking) will lose its character as thought altogether and will appear not to be conceptually distinguishable from any other sort of explanation of belief or behavior. Thus, it follows not only that unless we treat thought as embodied argument we will be unable to use logic as an instrument to evaluate thought, but that the concept of thought itself will disappear or undergo drastic changes.

It is perhaps worth noting at this point that a number of recent trends in linguistics and psychology are well in accord with this view of the nature of thought. It seems compatible with the approach toward the phenomena of language taken by linguists such as Chomsky and also is quite compatible with the view of thought which seems presupposed by persons interested in studying thinking via computer simulation. For example, P. C. Dodwell has written:

> ...It is not the "hardware" aspect of the computer analogy which commands most attention today, but rather the principles of programming ("software") which yield fruitful hypotheses about methods of solving problems which may be applicable as models of human thinking. Here is a nice irony: Philosophers have made much of the fact that human conduct is essentially rule following, and have taken psychologists to task for neglecting this characteristic; philosophers may well scorn the programming analogies to human thought, yet they are fascinating to psychologists (the analogies, I mean) just <u>because</u> of their rule-following routines! In fact, one of their main inadequacies as models for human thought is that they are only rule-following routines....[28]

Also, the account of thought given above seems to provide a reasonable justification for Piaget's procedure in theory construction in cognitive psychology (despite the

noted psychologistic tendencies which I believe are not essential to his approach). A central assumption of Piaget's approach to the study of cognitive development is that logic may be a fruitful tool for the study of cognition in that "the algebra of logic can help us to specify psychological structures."[29] That logic enables us to specify psychological structures is, I believe, the same claim as that thought may be characterized as the embodiment of arguments. It requires that the descriptive vocabulary of cognitive psychology be constructed out of a logical vocabulary.

At this point in the argument it is to be insisted that the above view entails neither a commitment to a priori psychology nor to empirical logic. This can be most easily seen by noting that in any case where some belief or behavior is accounted for in terms of some process of thought, the judgment about the truth of the explanation and the judgment about the validity of the embodied argument are distinct and logically separable events. Consider again the example where Jones' belief that q was accounted for by claiming that q had been inferred from the belief that p and the belief that $p \supset q$ by Modus Ponens. The claim that this explanation is true does not entail that the argument embodied in the description of the explanation is valid. It is quite conceivable that Jones might have believed q and believed that $p \supset q$ and might have inferred that p by affirming the consequent. Anyone who has ever taught a logic class will have some empirical evidence that such explanations are often true. The validity of the argument hardly follows. Thus, one cannot determine the validity of any argument by considering what kinds of thinking go into a true account of behavior.

Neither does it follow from the validity of some argument or the adequacy of some logic that it explains anything. If a logic can be used in a way that has explanatory power, it is not because it satisfactorily fulfills the criteria normally used to assess logics, but because, in fact, people think by means of it. Thus, one can only decide what sorts of intellectual process actually explain human behavior empirically. Presumably, the criteria for judging the adequacy of theories of cognitive psychology which construct their descriptive vocabulary out of a logical vocabulary are the same as the criteria for assessing the adequacy of any theory. The theory must satisfactorily explain the observed data.

Although, clearly, the view outlined above does not entail a commitment to a priori psychological theory or to empirical logic, it is, I believe, subject to a priori argumentation of a sort. That is, I believe it can be shown that any theory which denies the above view of the relations between logic and psychology in favor of a mechanistic view cannot adequately formulate the concept of

being justified in believing something. It would follow then that, if some theory incompatible with this concept of the relation between logic and psychology were true, its truth would entail that no one was ever justified in believing it (or anything else). Such a result, even though it does not quite amount to showing that theories of this sort are necessarily false (perhaps no one is ever justified in believing anything), will nevertheless be sufficiently damaging as to make the acceptance of any view which entails it suspect.

Consider the concept of a reason for believing something. Let us take propositions p and q. Now what does it mean to say that p is a reason for q? (Note that as of the moment we are not yet speaking of when believing p justifies believing q; we are merely talking about the relations between two propositions.) Here we should perhaps distinguish being a reason for and being a good reason for. Criteria for these concepts may be given as follows:

p is a reason for q iff
1. p implies q

p is a good reason for q iff
1. p implies q
2. p is true

The following remarks are called for in explanation: First, by 'implies' I do not mean material implication ($p \supset q$). Material implication is not appropriate because it is always possible for one proposition to be a reason for another even though the first is true and the second false. Consider, for example, that 'The sun rises in the East and sets in the West' is a reason for believing that the sun travels around the earth. Indeed, it is a good reason. It is just that there is additional evidence which warrants another view. Generally, we do not wish to deny that p is evidence for q simply because p is true while q turns out to be false. If we did, we could not, for example, make sense of talking about conflicting reasons. However, if "implies" is taken to refer to material implication, then given the standard truth table definition of material implication, we will not be able to hold that p implies q when p is true and q false. Material implication requires that when p implies q, then if p is true q is true, but this is stronger than what we want to say when we claim that p is a reason for q. Here we want to say that if we know p to be true, then we have some evidence for q, not necessarily sufficient evidence.

Thus, by "implies" in the above criteria and in what follows I shall mean that p implies q when there is some rule of inference whereby 'p is true,' is evidence for 'q is true.' What is important for our purposes here is to recognize the conceptual connection between the concepts of reason for, or evidence for, and the notion of rules of inference. Rules of inference, in effect, tell us when we

are entitled to hold that the truth of one proposition is reason for or evidence for the truth of another.

Next, we may formulate criteria for the concept of believing something for a reason. Again, we may distinguish believing for a reason from believing for a good reason. These notions may be formulated as follows:

A believes q for reasons iff

1. A believes that p
2. A believes that p implies q
3. A believing p and A believing p implies q cause A to believe that q

A believes q for good reasons iff

1. A believes that p
2. A believes that p implies q
3. p is true
4. p does imply q
5. A believing p and A believing p implies q cause A to believe that q.

The force of these analyses is to point out that in order to explicate what it means to believe some proposition q for reasons it is necessary to see the belief that q as having been inferred by the agent from something else that he believes. "Infer" here is the key word, because in order to describe someone as inferring q from p, it is necessary that q be thought to follow from p according to some rule of inference. If, perchance, believing p caused believing q in some other way, we would not be entitled to use the word infer, and we would not be entitled to hold that q was believed for reasons. Suppose, for example, that Jones' belief that the religious authorities would punish him if he did not believe in God caused Jones to believe in God, but that Jones was clear that "The authorities will punish me for not believing in God" is not evidence for "God exists." Here we would not say that Jones has inferred "God exists" from "The authorities will punish me if I do not believe in God" nor would we hold (assuming that this was a sufficient account of Jones' belief) that Jones had reason for his belief.

Obviously, the point of the above is to show that the concept of a reason for believing can be explicated only by means of a vocabulary which describes processes of thought by means of the vocabulary of logic. Thus, any view which holds that such descriptions are out of order will be unable to formulate the concept of a reason for believing. In effect, such a view will end up denying that people believe things for reasons, and once this is said it seems to follow that no one is ever justified in believing anything. In short, if such a view were true, no one would ever know it or anything else to be true. Such a view would, therefore, in this respect be self-refuting.

I have been arguing for some time now that a logical vocabulary is necessary for the description of reasoning processes. At this point some qualifications are required. Two sorts of issues are worth pursuing here.

First, it may be argued that regardless of the persuasiveness of the arguments for describing thought by means of a logical vocabulary, these arguments lead to a view of reasoning which fails to correspond very well with our own experience concerning our cognitive processes. Toulmin, for example, has written:

> Yet the idea that inferring is a kind of performance to be executed in accordance with rules, and that the principles of logic play the part of these rules, leads in turn to its own paradoxes. Often enough we draw our conclusions in an instant, without any of the intermediate stages essential to a rule-governed performance--no taking of the plunge, no keeping of the rules in mind or scrupulous following of them, no triumphant reaching of the end of the road or completion of the inferring performance. Inferring, in a phrase, does not always involve calculating, and the canons of sound argument can be applied alike whether we have reached our conclusions by way of a computation or by a simple leap. For logic is concerned not with the manner of our inferring, or with questions of technique: its primary business is a retrospective, justificatory one--with the arguments we can put forward afterwards to make good our claim that the conclusions arrived at are acceptable, because justifiable, conclusions.[30]

Toulmin's remarks have some merit and require some commentary and qualification of the view which has thus far been presented. We need especially to consider the following facts.

First, it is generally held by those philosophers for whom the notion of rule following has been important that the following of a rule does not require the ability to explicitly formulate the rule being followed, nor does it require some kind of conscious awareness of the rule, a holding of it before the mind as though one were reading a mental road map. The most obvious illustration of these points is the phenomenon of speech. Clearly the ability to follow semantic and syntactical rules is a necessary condition of either talking or of understanding a language.

Nevertheless men do these things typically without any conscious attention to the rules being employed and very often without being able to formulate the appropriate rules on request. Rule following does not require keeping the rule in mind.

Not only does the act of rule following not require an awareness of the rule being followed, but it need not involve an awareness of the act itself. Chomsky, for example, has claimed concerning the notion that there are innate principles of knowledge that there is no reason to suppose them to be open to introspection.

> Why should we suppose that the innate general principles, or the principles that integrate and organize our mature systems of belief, should be discoverable 'by dint of attention'? It would seem to be an empirical issue whether this is so (apart from terminological debate about the concepts of 'knowledge' and 'belief,' debate that is likely to be fruitless, since -- as Russell observes -- the concepts are unclear and indeterminate). It is an open question, surely, whether the 'species of instinct' that determines 'the experimental reasoning itself' does indeed 'act in us unknown to ourselves,' as both Hume and Leibniz held, or perhaps even lies beyond introspection.[31]

Even if we divorce this claim from the claim as to the innate status of these principles and if we generalize this claim to cover all cognitive operations Chomsky is correct. No contradiction follows from the suggestion that human minds perform cognitive operations which are neither introspected nor introspectible. Whether people perform such acts is an empirical question, and by empirical is meant that the fact that certain phenomena are explicable on the assumption that there are such mental operations and are not explicable without the assumption is good reason for believing that they exist.

These arguments indicate that we need not be overly concerned that when we are reasoning we do not appear to be "holding the rule before the mind's eye." Nevertheless, it is likely also a mistake to assume that because a person has been given or has acquired a piece of evidence and has produced as a result a conclusion that he therefore must have performed an act of reasoning, that he must have performed a set of mental operations which embody some argument which connects the piece of evidence with the conclusion obtained. It may be as Toulmin suggests that we "draw our conclusions in an instant, without any of the intermediate states essential to a rule governed performance..." It is

quite conceivable that such an occurrence might result from an association formed between a given premise and a given conclusion of a certain sort. It may be that a person who has been over a certain kind of intellectual ground frequently will easily draw a correct conclusion from available evidence without the necessity of formulating intermediate inferential steps. And it may be that reasoning often occurs only retrospectively when there is reason to check our conclusions. In short, it is not at all obvious that there is any reason to believe that when a person draws a conclusion from some evidence that his mental activity must correspond in any one to one fashion with any formalized or explicit argument (even an invalid one) which connects the evidence with the conclusion drawn.

Here it must be insisted that my thesis does not entail any contrary assumption. The position outlined concerns only how we are to understand a process of reasoning when it in fact occurs. As to when such processes occur or how their occurrence relates to other cognitive or non-cognitive processes which may form part of an adequate psychology of the origins of belief or desire is again an empirical question. Further even the claim that an act of reasoning has occurred requires few commitments about how the events will be experienced.

Perhaps these remarks might best be concluded by an attempt to state the minimum to which the claim that some set of mental events embody logical rules commits us. Let us introduce some symbols.

'M' shall stand for some set of mental events.
'R' shall stand for a reason-explanation.
'E' shall stand for an event explained by a reason-explanation.
'L' will stand for the logical rules involved in the argument expressed by R.
'U' will stand for the state of being able to follow L.
'A' will stand for some agent.

Now suppose A does E and provides the true explanation R. What must be true if we are to say that there are some events M which may be described as a process of thought? Let me suggest two conditions.

1. There must be some events M such that R is correctly ascribed to A because M is correctly ascribed to A. (In fact, I believe this condition is sufficient, but the possibility of truth of any reason-explanation itself has logical conditions which will be of interest to us. Thus, I shall add)

2. The possibility of A performing M depends on A having U.

In effect, it is demanded of some events M if they are to be treated as thoughts or the embodiments of logical rules that their occurrence constitute the truth condition of reason-explanations and that they depend on the under-

standing of the rules employed in the reason-explanation. In this context the import of this analysis is that it commits us to very little concerning the non-relational properties of these mental events and to very little concerning what the conscious experience of agents must be in order for M to have happened. Thus, I am inclined to think that the claim that some agent has performed an act of reasoning or has done something which is correctly explained by a reason-explanation is compatible with a wide range of possible experience concerning what seems to occur in such cases.

Consider a different sort of problem.

Thought processes can be described as the embodiment of logical rules. It does not follow, however, that they must be described in this way. If this is the case, then a more complicated account is required of the way in which a logical vocabulary is necessary to the understanding of thought processes.

The set of difficulties which I have in mind here can best be brought to light by pressing an analogy between minds and machines. Consider, for example, the sort of computer called a Turing machine. Such a machine typically consists of a tape upon which are printed the instructions for the machine to follow plus a set of mechanisms for reading and following these instructions. Such a machine can be described at one level by construction of a machine table. A machine table consists of an exhaustive description of the instructions printed on each segment of the machine's tape. Among these instructions may be certain logical rules. Thus, the succession of states of a Turing machine may be described as the following of these rules. Given these properties, a machine table gives a "logical" description of such a device.

Hilary Putnam has suggested that the following three similarities obtain between minds and Turing machines:

> 1. The functional organization (problem solving, thinking) of the human being or the machine can be described in terms of the sequences of mental or logical states respectively (and the accompanying verbalizations) without reference to the nature of the 'physical realization' of these states.
> 2. The states seem intimately connected with verbalization.
> 3. In the case of rational thought (or computing), the 'program' which determines which states follow which, etc., is open to rational criticism.[32]

The second and third of these points have, in effect, already been made. It is the first which is of interest. Neither a logical description of a process of reasoning nor

a machine table description of a Turing machine specify the way in which the states of the thought process or the states of the machine are physically instantiated. It has been held that it follows from the fact that one can conceive of minds without conceiving of any way in which they are physically realized that minds are not physical things.[33] Such a conclusion obviously does not follow; no more than it follows from the fact that one can provide a description of a Turing machine which does not specify its physical realization that a Turing machine is not a physical thing. The point of interest here, however, is that if one can provide a logical description of a Turing machine, one can also provide a non-logical one. The states of such a machine can be described in strictly physical terms, and the sequences of these states can be characterized as a mechanical process. There is no convincing reason for holding that this is not also the case with respect to processes of thought; that is, it is quite likely that the states of a process of thought have some physical instantiation (probably brain states) and that the sequence between these states can be described in terms of interactions between these brain states without the use of logical vocabulary. Thus, accounts of thinking and rational behavior can be developed at two levels, a logical level, i.e., an account requiring the use of a logical vocabulary, and a mechanistic level.

It seems to me that many of the more interesting and difficult problems of cognitive psychology concern the relationships between these two levels of explanation. For example, just as the machine table of a Turing machine can be instantiated in a number of different physical media, it is conceivable that processes of thought might be instantiated in a number of possible ways. The possible physical instantiations of a thought process constitute physical models of such processes. Part of the task of research on the process of thought ought to be to determine which of these possible models is the actual one. On the other hand, our knowledge of thinking at a physical level can also affect research at the logical level. Since it is obvious that the physical model of human thought will be a neurological one, clearly any adequate logical description of thinking will have to be capable of being instantiated in a neurological model. Thus, neurological and psychological research ought not to be considered as separable enterprises. Far from it, the study of the relationships between these two levels of description may constitute one of the most promising lines of research into the human mind.

It should be noted at this point that the fact that thought processes can be described in a language not employing logical terms does not show that the logical level of description can be dispensed with. Physical models of logical processes are, after all, <u>models of</u>.[34] Thus, while

the above argument may show that an explanation of a particular instance of rational behavior can be described in language which does not contain any logical vocabulary, it also shows that the logical description of thinking is logically prior and that an adequate theory of thinking cannot be developed independent of an adequate logical description of thinking. This is the primary sense in which thinking must be described in terms of a logical vocabulary.

We are now in a position where the potential difficulty for the concept of freedom which may be posed by a theory of thought may be stated in somewhat more precise terms. In the first section of this treatise it was argued that whether or not an action was free depended not on whether it had a cause, but on the sort of cause it had. Central to this claim is a distinction between what I have called reason-explanations as opposed to mechanistic explanations. It is at least a necessary condition of an action being free that it be possible for it to have had a reason-explanation as part of its causal history. The difficulty with some psychological theories is that given what is meant by "reason-explanation," they suggest or entail that all reason-explanations are false, and thus suggest or entail that no acts are ever free. To make this point we need first to make explicit the distinction between a reason-explanation and mechanistic explanations.

Since we are at present interested largely in mental happenings let us put the question as follows. Suppose someone to believe that p; what would count as a reason-explanation of this belief? The concept of a reason-explanation may then be expressed as follows: E is a reason-explanation of some belief that p if E contains an embodied argument for p. In short to provide a reason-explanation of some belief is to claim that the belief is the result of some process of reasoning. We may, then, define a mechanistic explanation as any explanation which is not a reason-explanation.

There is a fairly clear cut criterion by means of which any reason-explanation may be identified. Since a reason-explanation contains an embodied argument a reason-explanation always opens the possibility of two sorts of evaluation. We may on one hand evaluate the truth of the explanation. Reason-explanations like any other are either true or false, they either succeed in explaining the phenomenon in question or they do not. On the other hand when a reason-explanation is given, not only may we evaluate the truth of the explanation but the argument which it embodies. We may ask not only if the explanation explains the belief that p, but if the embodied argument justified the belief that p. For mechanistic arguments this second kind of question does not arise. We might, for example, explain some belief by reference to a history of reinforcement. Since, however, histories of reinforcement do not

contain embodied arguments one cannot evaluate them. Thus, the question as to whether the reason-explanation contains good reasons for the belief that p does not arise. (Although the question as to whether a person is justified in believing that p does arise since believing p for no reasons at all usually entails that one is not justified in believing that p.)

Given this analysis of the concept of a reason-explanation and the connection between reason-explanations and freedom, it is reasonably clear that so far as a philosophy of freedom is concerned the interesting property of a cognitive psychology is its opinion of reason-explanations. Some psychologies provide accounts of thought which do not involve the concept of a reason-explanation and which if linked to a claim of sufficiency in accounting for the phenomena entail that all reason-explanations are false. In others one finds what appear to be analogues of the concept but often in a much distorted fashion. In others (less interesting from this point of view) the concept of freedom is constructed independently of the concept of reason. In all cases psychologies having such properties will do violence to the concept of freedom. Let us proceed to examine some of them.

B. The Psychology of Thinking

If it is the case as has been argued that the crucial issue to be decided in determining the effects of a psychology on the concept of freedom is its ability to formulate the distinction between a reason-explanation and a mechanistic explanation, then we must begin to look at specific positions in psychology to determine how they stand on this question. It will be helpful in doing this if we develop some distinctions which will enable us to organize the inquiry.

First, we should distinguish between problems which originate in the meta-theory of some psychology and problems which arise in the theory of a psychology. Modern psychologies are often just as much the expression of opinions concerning the nature or appropriate form of psychological explanations, terms, or research as they are an expression of what the data which they explain happens to be. Modern behaviorisms, for example, are frequently argued for not only on grounds of explanatory success, but in terms of a philosophy of science. Skinner in his argument for behaviorism in Beyond Freedom and Dignity spends far more space claiming that his views exhibit adequate ideals of what science is supposed to be like than he does in showing that his views have succeeded in explaining the appropriate data. Moreover, cognitive psychologies are frequently attacked on grounds that the vocabulary which they employ is somehow illicit in that it refers to unobservable entities. Such an argument is, of course, clearly not an attempt to

show that a psychological theory is false because it fails to explain the data. Rather it is an attempt to show that such theories are ill-formed; that they are out of order in principle because they do not conform to some ideal of adequate science, in this case a rather strict empiricist theory of concept formation.

Thus, if the distinction between reason-explanations and mechanistic explanations does not appear in a particular psychological theory, we shall need to ask whether this is a matter which goes beyond an issue of what the psychologist believes to be necessary to explain the data to an issue of the psychologist's theory of theories. One reason for asking questions of this sort is that we shall want to discover whether the problems posed by psychology for human freedom were invented there or were originally imported into psychology from the philosophy of science. (I suspect that most psychologists who are committed to the view that men are not free are so committed because they are bad philosophers rather than bad psychologists.) The distinction also suggests that it is just as important to look at views psychologists hold about the nature of their science as it is to look at the features of the particular theories which they hold.

To proceed, it will also be helpful to have some classification of psychological theories. I shall construct such a classification according to the sort of vocabulary employed by a psychology. This will be useful because the capacity of a psychology to formulate the distinction between a reason-explanation and a mechanistic explanation is in part at least an issue about the sort of vocabulary which the theory does or is willing to employ. The classification may be constructed by means of two different distinctions. First, I shall distinguish between what I shall call centralist and behaviorist theories. Second, I shall distinguish between mentalist and non-mentalist theories. These terms may be defined as follows:

1. Centralist: I shall call a psychological theory centralist if its explanatory vocabulary contains terms referring to internal unobservable events or states of an organism. I shall consider that a thing is unobservable if it is unobservable either in principle (it is not the kind of thing to be seen) or if it is unobservable in practice (it is not feasible to observe it in the process of psychological research, e.g., brain states). Further, introspection will not count as a kind of observation.

2. Behaviorist: I shall call a theory behaviorist if it contains only explanatory terms which refer to observable behavior and stimulus conditions or terms which can be treated as logical constructions out of such terms and are in principle eliminable in favor of such terms. I shall treat this view as the psychologist's version of the more general view that terms are permissible in science only if they refer to something that one can directly observe or if they can be treated as logical constructions out of such

terms. It should be noted that 'behaviorism' here means 'logical behaviorism' which is obviously related to but not necessarily identical with S-R theory. There are behaviorists (often philosophers) who are inclined to reject S-R psychologies and S-R psychologists who have abandoned (sometimes unintentionally) logical behaviorism.

3. Mentalist: A theory will be considered mentalist if it contains terms which refer to mental states or events.

4. Non-mentalist: A theory will be considered non-mentalist if it does not contain terms which refer to mental states or events.

These distinctions yield four categories of psychological theories.

1. Theories which are centralist and mentalist.
2. Theories which are centralist and non-mentalist.
3. Theories which are behaviorist and mentalist.
4. Theories which are behaviorist and non-mentalist.

It should be noted that while there is a tendency for a theory which is centralist to also be mentalist and for a theory which is behaviorist to be non-mentalist, this is not necessarily the case. At least there are instances of each of these four groups. Cognitive psychologies typify the first category. Neuro-physiological accounts of behavior are paradigmatic of the second. Theories of the third class are those which treat mental terms as logical constructions out of behavioral and stimulus terms. Tolman, for example, wants to regard the concept of purpose as an intervening variable. Skinnerian psychology exemplifies the last group.

Two difficulties in applying these categories should be noted. First, it is characteristic of theories of the second sort to function as models of theories of the first sort. Thus, people who talk about (let's say) the encoding of information on DNA molecules often think of themselves as telling us what memory is or how it works, and people who work with computers believe themselves to be simulating intelligence. Indeed, I am not aware of any theories of the second sort whose authors regard them as excluding theories of the first sort. For this reason, I am inclined to believe that for purposes of this study we need not interest ourselves in this second class of theories. Ultimately they will only lead us to the first.

Second, there is often some difficulty in deciding whether certain psychological theories fit into the third class or the fourth class of theories because there seems to be some difficulty among behaviorist psychologists in deciding whether they are defining mental terms in a behavioral language or whether they are replacing objectionable mental terms with non-objectionable behavioral terms. This interpretive difficulty has been nicely expressed by Norman Malcolm with respect to Skinner's work.

> The question as to whether or not Skinner would accept the inner variables 'pretains to the typical ambiguity of

> behaviorism.' Watson, for example, seemed, on the one hand, to be denying that consciousness exists, but,on the other, he tried to say what thinking is--tiny movements of the speech apparatus. The ambiguity resides in only seeming to deny the existence of thinking, while, in reality, one is giving an analytic reduction for the term. A similar ambiguity runs through Skinner's writing to some extent. 'I still hope and believe that, if it came to the pinch, Skinner would admit that people do get depressed, tired and hungry, annoyed, and so on....The only position for Skinner...as a behavioristic philosopher, is to say that his quotation marks mean that this is a term for which he is going to give a reduction.'[35]

In what follows I shall usually treat Skinner as an instance of the fourth class partly because I am inclined to believe that he actually belongs there and partly because doing so will provide a ready vehicle for development of the logic of the fourth category.

Finally, note that the classification of psychological theories developed above is constructed in response to two different questions. The behaviorism-centralist option is taken by me to represent choices on an issue concerning the criteria of admissibility for the non-logical vocabulary of a theory. The question is as to whether terms which neither refer to observable events nor can be exhaustively analyzed into terms which refer to observable events are to be permitted in a science of behavior. Centralist theories are those which find theoretical vocabulary, i.e., vocabulary not reducible to observation terms, permissible in psycho- o . . Behaviorist theories are those which restrict their non-logical vocabulary to terms with observable referents or to "intervening variables," i.e., terms which are logical constructions out of terms with observable referents. The second question--the question of the appropriateness of mental state terms in psychological theory--is often a matter of deciding whether or not mental state terms can meet the criteria for admissibility for scientific vocabulary whatever they may be. Obviously, then, while a behaviorist may believe that mental terms can meet his criteria there is more of a tendency for behaviorists than centralists to reject the use of mental terms in that (a) the behaviorist's criteria of admissibility for the theoretical vocabulary are stricter than the centralist's criteria and, (b) the difficulties involved in treating mental terms as eliminable in some kind of observation language are, to say the least, formidable.

A second distinction between basic kinds of psychological theories will be useful. Here I wish to distinguish between theories which I shall call associationist theories and those which I shall call Neo-Kantian.

I shall call a psychological theory associationist if it maintains that the central concept in explaining the human being's capacity to learn and to perform actions which depend on learning is the capacity to form associations between stimuli and responses. I shall call a theory Neo-Kantian if it assigns to the mind a role in organizing or interpreting experience and employs concepts of this sort in accounting for behavior.

The concept of association can be usefully formulated in terms of two features. First in some psychologies the concept appears to be in part an extension of a commitment to a behaviorist theory of concept formation. The idea that learning is to be accounted for in terms of the associations formed between stimulus and response can be merely a different way of requiring that any theoretical terms in a psychology be capable of reduction to relations between externally observable variables. On such a view learning must be construed as the acquisition of a disposition to respond to a particular stimulus with a certain response. In effect, a behaviorist theory of concept formation requires that the laws discovered by psychology be varieties of the hypothetical form "If S, then R." To say that an association between some stimulus, S, and some response, R, has been established may in fact amount to nothing more than saying that some proposition of the form "if S then R," is true. In this respect the concept of an association is a purely formal concept, and being a purely formal concept it does not assign to the relations between S and R any properties beyond those necessary for the truth of propositions asserting the existence of a contingent and law-like connection between two empirical variables. Indeed, it may be understood as excluding the employment of any concepts mediating between the S and R.

I suspect, however, that as it is used by most behaviorist psychologists the concept of association represents more than a way of asserting the bare fact of some law-like connection between an S and an R. Rather the term 'association' functions as a name for the process whereby such connections between an S and an R are established. They are associated. And to say that some S and some R are associated is to say more than merely "if S, then R," (although it is to say that too), it is to say that S leads to R in a certain way. For example, it is common among those psychologists who have been influenced by Hull to characterize an established S-R connection as a habit. To characterize the S-R bond as a habit, however, suggests that the bond was established gradually over a period of time. It is to suggest that some number of repetitions were necessary to establish the disposition to do R when presented with S, and it is to indicate that R occurs

"mechanically" when S occurs. There is no thinking about what to do involved in getting from the S to the R. Indeed, in the technical sense of "do" (in which to do something is to act, not merely behave) there is no doing at all. There is only happening. Rs happen as a result of habits linking Ss and Rs. Habit is thus a mechanistic concept which appears to exclude connecting Ss and Rs by means of cognitive or teleological concepts.

Neo-Kantian psychologies can also be characterized by means of two properties. First, for the Neo-Kantian the mind is assigned an active role in mediating between the input which the person receives and his behavior. The agent's cognitive apparatus contributes to or structures his experience. Thus, what the agent responds to and the input the agent receives from his environment are not the same thing. The person responds to structured input, and an adequate account of his experience requires an understanding of the agent's conceptual apparatus as well as a grasp of the requisite input.

The second feature of what I shall term Neo-Kantianism is that concepts like cognitive structure are to be explicated in terms of the concept of following a rule. For Kant the concepts and categories of the mind were essentially rules, or as he sometimes called them, schema, which served to structure or organize experience. This concept of a rule which serves to order, structure, or organize some range of experience is to be found in a variety of psychologists, philosophers and linguists. Persons such as Piaget, Chomsky, and Wittgenstein will serve as paradigm cases.

The following features concerning this distinction between associationist and Neo-Kantian approaches to psychoogy should be noted. First, unlike the previous set of categories, this set does not exhaust the logical options. The concepts of associationism and Neo-Kantianism are not formulated as contradictories, and in fact there are some basic orientations in psychology which either do not or at least need not fit in either group. Freudian and Gestalt theories are perhaps the most prominent instances. Neither of these views places much emphasis on the concept of rule-following. Second, Neo-Kantianism is obviously formulated in mentalist terms, while associationist concepts tend to be used in standard behaviorist theories as alternatives to mental terms. The fact that behaviorist theories in psychology are often committed to both a strict empiricist theory of concept formation and to the doctrine of associationism explains why they often appear in the fourth category of my typology of psychological theories while philosophical behaviorists who typically lack a commitment to associationism wind up in the third category. Finally, and most importantly, the central concept of concern to us at this point, the concept of a reason-explanation, was clearly expressed in Neo-Kantian categories. The concept of reasoning was explicated in terms of the following of logical rules. While it would be premature to conclude

that because associationism is formulated in opposition to a Neo-Kantian view, associationism cannot formulate an adequate concept of reasoning (some associationists have attempted to understand certain rule-following activites in terms of underlying associationist mechanisms), nevertheless it is clear that the concept of reasoning will become problematic for standard associationist psychologies.

These categories may be used to formulate a rough distinction between cognitive and behaviorist psychological theories. Most cognitive psychologies are (1) centralist (2) mentalist and (3) Neo-Kantian. On the other hand most behaviorist psychologies (here I am talking about empirical theories not logical behaviorism) are (1) behaviorist (logical behaviorism), (2) non-mentalist, and (3) associationist.

Now the preceding remarks suggest that it is behaviorist psychologies which ought to be of interest to us in this study for it is behaviorist psychologies which will create problems with respect to constructing the distinction between reason-explanations and mechanistic explanations. The discussion of Piaget and others in the preceding section should have made it clear that dominant centralist theories do in fact assume a distinction of the appropriate sort. And since the theories of concept formation associated with centralist theories are quite permissive, no difficulties here would be anticipated. On the other hand, as I shall show, there are behaviorist theories concerning human thought in which such a distinction does not appear. Further since behaviorist theories of concept formation are rather strict, there may be reason to suspect that such a distinction will be difficult to construct within the confines of the permissible vocabulary of some behaviorist psychologies. Specifically, it should be noted that the distinction between reason and mechanistic explanations was constructed in an obviously mentalistic vocabulary. Whether it could be successfully reconstructed in a non-mentalistic vocabulary is a matter of some doubt.

In what follows I shall limit the discussion to theories or viewpoints which are behaviorist in the sense that they accept a behaviorist view of the criteria for the admissibility of appropriate vocabulary or that they are associationist. I shall first want to look at some of the logical consequences for the conceptualization of thinking which seem to stem directly from logical behaviorism. Second, I shall want to look at several behaviorist theories of thought to see what features they actually exhibit.

In order to begin to develop some of the problems involved, let me again turn to some remarks of Professor Skinner, this time on the topic of human thinking. In the following remarks taken from The Technology of Teaching Skinner is attempting to show that programmed instruction which he believes to be a natural extension of the

principles of operant conditioning into education is capable of more than simply transmitting verbal knowledge and motor skills. In fact programmed instruction can be used to teach even something as complicated as thinking, but, of course, only if we have a proper idea of what thinking is. We must recognize that thinking is behavior.

> 'To think' often means simply to behave. In this sense we are said to think verbally or nonverbally, mathematically, musically, socially, politically, and so on. In a slightly different sense, it means to behave with respect to stimuli. A man may think it is raining when he has been wet by a lawn sprinkler beyond a hedge. No special problem arises in teaching the repertoires which are exhibited as we think in either of these senses.
>
> Thinking is also identified with certain behavioral process, such as learning, discriminating, generalizing, and abstracting. These are not behavior but changes in behavior. There is no action, mental or otherwise.[36]

Why treat thinking as behavior or behavioral change? Part of Skinner's response can be gleaned from his description of what he calls the traditional view of thinking.

> The traditional view is that thinking is an obscure, intellectual,'cognitive' activity--something which goes on in mind and requires the use of rational powers and faculties. It leads to action when the thoughts to which it gives rise are expressed, but it is not itself behavior. It can sometimes be observed by the thinker, but it can also be unconscious, and introspective accounts are therefore not very consistent or helpful. Outstanding instances of thinking seem especially likely to arise from obscure intuitions or insights, and great thinkers seldom have great thoughts about thinking. This is particularly unfortunate because thinking in this sense is never observed by anyone except the thinker. (If we believe that others think as we do, it is only because they arrive at the same expressed conclusions, given the same public premises.)
>
> So defined, thinking is hard to study.[37]

Two related but distinguishable strains in Skinner's remarks should be noted. Part of Skinner's difficulty with the "traditional view" is practical. When we are teaching,

our goals are not primarily to explain or understand human beings, but to change them. But mental processes are notoriously difficult to manage and manipulate. Even if these are research strategies which enable us to study, for example, cognitive variables as a function of age, these strategies are not of much use to a teacher who has not the time nor the resources to employ them. If the teacher wants to teach thinking he must know what sorts of behavior are to count as indicating that the student is thinking and what to do in order to create these behaviors. Clearly, given these needs, it is more useful to think of thinking as behavior than it is to regard thinking as a mental or cognitive process.

Behind this argument, however, there would appear to be a commitment to a behaviorist view on the admissibility of scientific vocabulary. Consider that in the passage most recently quoted there is a tendency to treat mental vocabulary as inherently unclear. Cognitive activity is "obscure" presumably because it cannot be observed. Things, however, get cleared up when we begin to state our goals as behavior. Such talk seems to exhibit an obvious commitment to a behaviorist theory of concept formation. A term is meaningful to the degree that it refers to something one can see or can be analyzed into such terms. To have an unobservable referent is to be meaningless. Since mental terms seem not to refer to anything that one can see they are presumed to be meaningless. Since behavior does refer to something one can see, behavior becomes paradigmatic of clarity.

The philosophical commitment to a behaviorist theory of concept formation is clearly exhibited in the following remarks from a text on applying operant conditioning techniques to the classroom.

> Operant techniques will not 'improve self-concepts,' will not 'instill good citizenship.' These are not behaviors. They are fuzzy definitions that exist only in words. One can use operant techniques to teach a child to comb his hair, to increase his rate of smiling, or to utter a high rate of phrases like, 'I am happy; I feel good; I like myself.' They can be used to teach children to salute a flag, walk on the sidewalk, and throw papers in wastebaskets.[38]

It is to be noted that the somewhat more modest view that for a term to be permissible in science it must be linked by a correspondence rule or an operational definition to something observable, does not require any hostility to the use of mental terms in psychology even if one assumes that mental terms cannot be exhaustively translated into relations between environmental and behavioral variables. On this view the association of a "hypothetical construct" with something observable is a condition of its identi-

fication and thus of its scientific usefulness, but it is not a condition of the meaningfulness of terms denoting hypothetical constructs. (Indeed it could be argued that on such a view the clarity of a term is a precondition of its being given an operational definition. How could one decide the adequacy of an operational definition without an antecedent understanding of the concept being defined?) Thus, while views of concept formation in the behavioral sciences weaker than those usually ascribed to by behaviorists do require that their theoretical vocabulary, including mental state vocabulary, be tied to observations in some fashion or other, they do not provide any reason which would justify the assumption that mental state vocabulary must be obscure, vague or meaningless. Since Skinner inevitably assumes this about mental state vocabulary it is reasonable to assume that his attitude is a result of his acceptance of a behaviorist theory of concept formation. That is, Skinner appears to hold (1) that only terms referring to something observable or terms which are logical constructions out of terms which refer to something observable are meaningful and (2) that mental state terms cannot meet this requirement.

What are the consequences of these views? Does the requirement that thinking be treated as behavior of some sort preclude the appearance of concepts such as a reason-explanation or a logical operation in a behavioristic psychology? There are some reasons to think this to be the case. First, since the concept of a reason-explanation and a logical operation are constructed in a mentalistic vocabulary it is obvious that a psychology which has no place for mentalistic vocabulary will have some difficulty with the concepts of a reason-explanation and a logical operation. This is not a conclusive consideration, however. First, we have to deal with the kind of problem which results from the sort of ambiguity that Malcolm notes in the attitude of behaviorists toward mental terms. It is never quite clear whether behaviorists are rejecting the use of mental words or whether they are demanding that we provide behavioral analyses of them. This ambiguity is clearly evident in Skinner's remarks, for while he obviously objects to the use of mentalistic vocabulary in psychology, nevertheless, he is proposing to tell us what thinking is, and it is rather hard not to notice that "thinking" is usually thought to be a mental term. (Such confusion likely results from the failure to distinguish mentalism from centralism. If we hold that what Skinner actually objects to is not mental vocabulary, but centralism, then his tendency to follow objections to mental terms in psychology with attempts to provide behavioral definitions of mental terms is not quite as paradoxical.) If, however, some mental vocabulary is available to the behaviorist psychologist, it may be that behaviorism is not as hostile to concepts such as a logical operation as might appear to be the case initially. In addition, while the distinction between a reason-explanation

and a mechanistic explanation was constructed in a mentalist vocabulary, it is not entirely self-evident that this is necessarily the case. In fact, there are accounts of thinking in the literature generated by behaviorist psychologists which are not mentalistic but in which a distinction which is a reasonable analogue to the distinction between reason-explanations and mechanistic explanation appears. There is even a suggestion of such a distinction in some of Skinner's writing. Thus, it is far from clear that a behaviorist theory of concept formation precludes the formulation of a viable concept of thought.

A second reason for suspecting that a behaviorist will have some problems with concepts such as reason-explanation or logical operation is the impoverishment of the vocabulary typically employed in standard behaviorist theories. Even if the enterprise of constructing mental terms out of a behaviorist vocabulary is not rejected out of hand, the behaviorist has not got a very good selection of vocabulary with which to proceed. Terms like stimulus, response, and reinforcement do not look highly promising when the enterprise is to construct out of them a concept of a complexity of a logical operation. It is not surprising, therefore, that in Skinner's attempt in The Technology of Teaching to explain what kind of behavior thinking is, one finds that it has to do with attending, self-manipulation, and problem solving in which the concept of a logical operation, indeed the concept of reasoning seems not to have a part.

This is not a very convincing objection either. The rather limited vocabulary of behaviorism merely points to the difficulty of constructing mental terms in a behaviorist language, not the impossibility of the enterprise. Neither is the non-appearance of the requisite concepts in Skinner's description of the nature of thought particularly interesting. It may follow from the non-appearance of a concept like the concept of a logical operation in Skinner's analysis of thought, that the concept is deficient, but what we want to know is whether the source of this deficiency is correctly located in Skinner's theory of concept formation. We do not, however, have sufficient evidence to decide that.

Thus to decide these issues we clearly need a more complicated account. I shall, therefore, proceed as follows. First I shall look into the logical relations between a behaviorist theory of concept formation and the conceptualization of thought. Initially, I shall try to show that there is a logical connection between logical behaviorism and what I have called strict formalism. Next, I shall try to illustrate some of the difficulties involved in constructing a view of reasoning in a non-centralist vocabulary. My purpose here will not be to construct an argument which will show that it is logically impossible to construct a viable concept of reasoning in a behaviorist vocabulary. I know of no such argument. Rather, by illustrating the immense difficulties that a behaviorist must overcome in

order to construct a concept of reasoning I hope to show that the behaviorist has considerable motivation to "simplify" the phenomena. Finally, I shall examine some particular behaviorist theories of thought which I believe are paradigmatic of how behaviorists have conceptualized the concept. I shall treat these cases as tests of the thesis that a behaviorist theory of concept formation tends to a kind of "logical erosion" of concepts such as thinking. I shall do this by showing that behaviorists have been able to formulate plausible concepts of thought only at the price of abandoning both associationism and a behaviorist theory of concept formation and conversely, behaviorists who maintain associationism and logical behaviorism intact tend to seriously distort the concept of thinking.

The claim that behaviorism leads to strict formalism can be shown as follows. Consider the following passage from an article by Paul Hirst.

> ...it becomes clear that terms like inferring, deducing, being creative or imaginative, are not labels for distinctive activites in a private world of the mind. Indeed they are terms we use to express the fact that the public use of language or other symbols has reached certain agreed standards. Of the inner processes of the mind in achieving such standards, we know and can know nothing. To say that a person deduced something, is not to say that whatever the sequences of thought were, a chain of propositions that have certain formal relations was set up as a result. How this was achieved is another matter. What is important in this case is not that a uniform pattern of thought processes be established in the mind, but the establishing of sequences of symbolic expressions that come up to agreed standards.[39]

Note first that in the philosophical camp with which Hirst is properly associated, ordinary language concepts and categories tend to have a normative aspect to them. That is, one does not deny that men have purposes or intentions or that they do things like reasoning or thinking. Instead, the philosophical problem is to understand such concepts, to grasp how they are used or how they function in ordinary language. If one happens to ascribe to some version of a behaviorist theory of concept formation, then, so far as mental concepts are concerned, the philosophical task is to explicate their logic from a behaviorist point of view or to construct them in a behaviorist language.

What is interesting in Hirst's argument is that a conclusion resembling strict formalism is derived from a premise which seems to have some affinity to logical behaviorism. The central premise of Hirst's argument is that inner processes are unknowable. They are unknowable, apparently because they are private and thus not publicly observable. He concludes from this piece of evidence that words such as 'inferring' or 'deducing' cannot refer to such inner happenings, but instead they refer to some public phenomena. Such terms refer he says to a chain of propositions having formal relations which have been "set up." In other words, to describe someone as having deduced or inferred is not to describe a mental happening, it is to describe a feature of a person's verbal behavior. Presumably one "sets up" chains of propositions by talking or writing. To deduce on Hirst's view is then to say or write some set of propositions having some deductive relation between the members of the set. It is to produce a piece of behavior which exhibits appropriate logical properties, or in Hirst's words which has reached "certain agreed standards."

This view of the referents of logical terms such as 'deducing' and 'inferring' has the following in common with what I have called strict formalism. Like strict formalism it maintains that logical terms are concerned with products of thought, not with the mental processes which generate them. To use a word like 'deducing' or 'inferring' is to say something about a set of propositions, namely that they exhibit appropriate logical relations. These terms do not refer to any act or mental process which generates such propositions. The only requirement to be met which suggests any connection between words like 'deducing' and 'inferring' and a human activity is that these propositions must be "set up." It should be clear here, then, how starting from a perspective of logical behaviorism one is easily led to a position readily supportive of strict formalism. The idea that one cannot know internal mental events, but only their effects, easily leads to the view that words like 'deducing' and 'inferring' refer not to a set of mental events, but only to the logical properties of the products of these events. Assuming that the products in question are expressed as arguments, then behaviorism easily leads to the conclusions that words like 'deduce' and 'infer' merely describe the logical relations between "set up" propositions and that the task of logic is to evaluate the product, not the process of thought. Such a position seems indistinguishable from strict formalism.

Considerable care should be taken, however, in ascribing such a position to Hirst for I suspect that his argument is susceptible to a second reading. Let me label the above reading of Hirst's argument the "anti-mentalist position." It can be explicitly rendered as follows:

1. Mental acts are internal events.
2. Mental acts are, therefore, unknowable.

3. 'Deducing' and 'inferring' cannot be mental act descriptions. Instead they are behavioral descriptions, i.e., they characterize the logical relations between "set up" propositions.

Hirst's argument can also be read in the following manner which I shall term the "reconstructionist position."

1. Mental acts can be expressed in a behavioral language.
2. Whatever internal processes that there may be which produce behavior (such processes are not to be identified with mental acts) are unknowable and irrelevant to the explication of mental concepts.
3. Deducing and inferring are mental acts which can be explicated in a behavioral language.

The conclusion to be drawn from this second reading is that the difference between strict and moderate formalism is less marked than I have presented it in the first portion of this chapter.

On the second reading of Hirst's argument the claim that words like 'deducing' and 'inferring' report mental happenings and the claim that they describe logical relations between "set up" propositions turn out to be nearly the same claim since to perform the mental act of deducing or inferring is to set up propositions which exhibit the appropriate logical relations. Moderate formalism here would differ from strict formalism in that it would permit a description of the logical relations obtaining between propositions to be stated in a psychological vocabulary (deducing, inferring) on condition (a) that the propositions in question exhibit the required logical features (that they are instances of deduction or inference), and (b) that they were "set up." Thus, there would remain some small disagreement between the strict and moderate formalist even on Hirst's position. On the second reading of Hirst's argument, assertions which describe mental acts in a vocabulary constructed from logical terms are permissible. In this respect a "behavioralized" moderate formalism would differ from a strict formalism in that it would permit logical points to be expressed in a psychological vocabulary. However, a behavioralized moderate formalism shares with strict formalism the view that words like deducing and inferring refer to the properties of public events and do not refer to any unobservable processes which produce these events.

On either reading of Hirst's argument it is the view that words like infer and deduce assert that a set of propositions have certain logical properties, but do not assert anything about the events which produce these propositions which is problematic. It follows directly from this view that words like deduce and infer cannot function as explanatory concepts, and it follows from this that logical concepts cannot have the regulative function that I have indicated they have in Section II A of this report. When logical concepts cannot be part of an explanation of

the production of arguments, it is difficult to see how an appeal to logical standards could be effective in making any difference concerning whether or not produced arguments meet these standards. These claims can be developed as follows.

On Hirst's view a statement of the form 'X deduced (is deducing)' says:

1. X set up (is setting up) propositions P, and
2. P exhibit a logical form of type D, deduction.

(What is not clear in Hirst's remarks is whether this is supposed to be an analysis of a mental act called deduction)

What gets left out in this analysis is any suggestion that a notion like deducing might have explanatory force. One would not respond with some form of "I deduced it" to a question asked concerning how he came to assert some proposition. Suppose, for example, Jones, having been asked, "Why did you assert q in answer to my question?" responded, "I deduced it from $p \supset q$ and p. Hirst should hold this to be equivalent to

1. I set up proposition q
2. q follows deductively from $p \supset q$ and p

On this reading it would appear that Jones is responding with a justification of his response, i.e., it appears that he is claiming that he is entitled to assert q because q follows from $p \supset q$ and p. However, on Hirst analysis it is difficult to construe a claim like "I deduced it from..." as an explanation of Jones' assertion as well as a justification for it. For Hirst's analysis informs us only that Jones exhibited a piece of verbal behavior and that this piece of verbal behavior (or if one prefers, the proposition which it expresses) exhibits certain logical properties. It says nothing whatsoever about Jones which would enable us to explain why Jones happened to assert q. In order to turn Jones' response to our question about his assertion into an explanation, it will be necessary to assume some things about the connection between the justification of q and Jones' mental states, namely that Jones believes p, believed $p \supset q$ and that he inferred or deduced q as a result of these beliefs. In short, it is necessary in order to treat Jones' remark as an explanation of his assertion that q to treat words like deduce as names for mental events of a certain sort - those described by means of their connection to some logical vocabulary.

If the logical concepts necessary to describe the justification of a proposition cannot be incorporated into the psychological concepts necessary to explain the verbal behavior which exhibits these logical concepts, then it becomes impossible for logic to play any regulative role in the generation of logical behavior. To hold that logic plays a regulative role in the generation of some piece of verbal behavior is to say that having learned the appropriate logical concepts or having learned to follow the appropriate logical rules makes a difference in the kind of verbal behavior exhibited. To say that learning to employ

logical rules makes a behavioral difference is, of course, to say that the acquisition of such abilities is part of the explanation of such behavior. Clearly this requires that logical concepts be employed in the construction of a psychological vocabulary necessary to explain verbal behavior which exhibits logical relations.

The objection to strict formalism expressed earlier in this section could be reformulated as the claim that in order to avoid the sin of psychologism strict formalists refuse to permit the use of logical terms in explanatory sentences for to do so requires the mixing of logical and psychological concepts. I have shown that such a position has some unfortunate consequences since it follows that we cannot make sense out of the idea that logic regulates thought or any other claim which depends on the claim that logic regulates thought such as the claim that people can be taught to think. What I hope that my discussion of Hirst will have shown is that behaviorism easily leads to a similar conclusion, for behaviorism easily contributes to the view that logical terms function to describe the relations among propositions but that they are not appropriately employed in accounting for the verbal behavior in which these propositions are asserted. It would be too much to say that behaviorism entails such a position. Nevertheless it is clear that logical behaviorism and strict formalism have a kind of affinity for each other and as a corollary it follows that moderate formalism is most easily expressed within the confines of a centralist psychology.

In fairness to Hirst, some qualifications on my objections to his argument are required. Clearly I have attacked what Hirst would undoubtedly regard as a peripheral aspect of his argument. The central thrust of Hirst's paper is to find a middle ground between two theories of meaning. On the one hand he wished to reject the view that the meaning of some sentence is some non-verbal mental event which lies behind the sentence. He describes the view of thought assumed by this view as follows:

> In these operations the mind is said to abstract, infer, deduce, etc. These activities are carried out by the mind, or the mind is an instrument by which we perform them. As Professor Ayer rather nicely expressed it once, just as we see with our eyes and we walk with our legs, so we think with our minds[1]. And all this can in principle occur quite independently of any use of language in which thoughts can be expressed. Indeed when expressed in language, the words and sentences have the concepts and propositions of thought for their meaning. In communication, thoughts are coded

> into words and then decoded by the recipients back into thought. So behind all manifestations of intelligence there goes on this life of thought that may or may not be made public in some appropriate symbolism.[40]

The reader will recognize that I am not particularly sympathetic to such a view either. For it is my view that while we do "think with out minds" it is clearly not my view that this thinking process is something non-verbal which must subsequently be translated into words. On my view the mental process called thinking is to be described by employing the same kinds of concepts used to describe public occurrences of language. Thought on this view is not behind language; rather thought is internalized language. Thus, my position does not affirm what Hirst wishes to deny, that thought is some non-verbal happening behind language. In fact it does not so far as I can see require that in all cases a distinction be made between thought and its expression. Talking **may** be thinking. That is, when a person asserts some proposition we may hold that he is talking and thinking and that there is only one event not two. On my view to claim that one is thinking entails only the commitment that mental events described in a certain way are occurring. It need not follow that when a case of thinking explains a case of talking that thinking must stand as a separate and antecedent occurrence on which talking depends. This perhaps sounds paradoxical, but it is not. One has only to consider the relation between flexing one's arm muscles and raising one's arm. Flexing one's muscles may form part of an explanation of arm raising. It is also part of the event of arm raising. Analogously thinking can explain talking without being a distinct antecedent event.

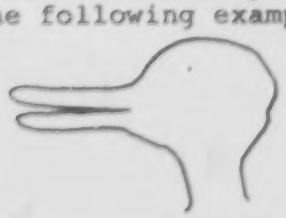
The other extreme which Hirst wishes to avoid is the view that the meaning of a sentence or a term is its referent. Again I agree. The point of disagreement concerns the middle ground. Hirst and I agree that meaning and thinking must be understood by means of concepts used to describe public linguistic happenings. Hirst seems to conclude that such concepts must, therefore, be about public linguistic happenings only and are, therefore, not about private mental happenings. I have tried to argue that mental processes can be described by means of the same concepts used to describe public linguistic happenings.

The preceding arguments have been intended as part of a general argument to show that an adequate account of reasoning is more likely to be expressed within the context of a centralist psychology. In what follows I wish to pursue the same line of argument in a somewhat different vein. Here again I wish to show that there are certain difficulties encountered in attempting to formulate a concept of reasoning which are much more easily handled within the context of a centralist psychology. This argument is

important for the following reasons. A behaviorist psychologist who rigorously adheres to both logical behaviorism and to associationism will, of course, be precluded from employing a logical vocabulary in quite the way I have used it in understanding thought. Clearly, for example, the concept of a logical operation is a mediating concept. To employ such a concept is to at once abandon both logical behaviorism and associationism. However, the behaviorist may attempt to introduce a logical vocabulary at a different point. Suppose, for example, someone responded to a set of premises of the form p ⊃ q, p with the utterance q. A behaviorist might claim that "q-behavior" had been conditioned to a "p ⊃ q, p-stimulus." In short a logical vocabulary might be used to characterize the stimulus and the response. Having claimed that learning logical behavior consists in associating premise-characterized stimuli with conclusion characterized responses, the behaviorist might then have claimed to have introduced a logical vocabulary into his account of reasoning without abandoning either logical behaviorism or associationism. It is essentially this claim I wish to counter. I shall show that such an attempt is unlikely to succeed and will likely lead back to a centralist and Neo-Kantion position. What I shall maintain, thus, is that there are reasons to assign to the mind a contributing or organizing role even in the perceptual aspects of the psychology of reasoning. I shall try to show that it is difficult to understand how the logical form of a proposition is recognized unless some centralist concepts are employed.

The argument I shall make concerning logical form is one case of a more general line of argument against a behaviorist theory of perception. The claim is that in many cases it is difficult to understand the stimulus to which the individual responds as a property of the external world. Rather the "what it is" that a person responds to is the result of the interaction of some external event and the cognitive apparatus of the person. Thus, the thing that the person responds to may result from some happening in the external world, but is never equivalent to it. Before trying to make this argument for the perception of logical form, I shall briefly suggest two typical lines of argument for the general difficulty.

The first problem stems from the fact that the observer seems to make a contribution to what he sees. He adds to the stimulus. What one sees is often more than the sum of its external properties. This fact has been made much of by both Gestalt Psychologists and by phenomenologists. It is a serious difficulty for any behaviorist analysis. Consider the following example taken from Wittgenstein.[41]



Now suppose two persons are asked, "What do you see here?" and one responds "A duck" and the other responds "A rabbit" What has been responded to? It seems fairly clear that one cannot hold that the thing responded to is anything from a set of lines to occular irradiation. Rather it seems that the stimulus, the thing that elicits the response, must be described as "drawing seen as rabbit" or "drawing seen as duck." One must build the concept "seeing as" into the notion of stimulus if the stimulus is going to turn out to be the thing actually responded to. However, what the 'as' in 'seeing as' seems to mark is a contribution of the observer to the experience or to put the point negatively the 'as' functions to note that what is seen and responded to is more than what is contained in the objective observable properties of the object, or for that matter, more than is contained in the occular radiation received from the object. It is, of course, a matter of some perplexity as to how we are to understand this contribution of the perceiver to the experience which he perceives. But the difficulties raised for the behaviorists concept of stimulus should be quite clear. One needs to postulate some sort of mediating process in order to understand what is responded to.

The second problem can be called the problem of set or filtration. In such cases the perceiver does not add something to the experienced situation, rather he takes something out. The observer seems to edit the experience or respond to it selectively. Paul Ziff suggests an example which illustrates both the phenomenon of set and the phenomenon of filtration.

> Consider the following sequence of events: a person is told 'Run to the window and see if there is a car in front of the house; it is very important'. Thus he receives auditory stimulation a1. He then goes to the window, receives visual stimulation v, say one-half second in duration. He returns and is asked 'Is there a cat by the lamp post across the street?'. Thus he receives auditory stimulation a2. Most likely he will not be able to say. Presumably the reception of a1 served to effect the processing of v in such a way as to render it unavailable for the processing required to answer the unexpected question.[42]

The example shows nicely that what people see or whether they see what is before them depends not only on what is there, but on what they are looking for. Set is a determinate of what is perceived. It also shows that people have the capacity to eliminate irrelevant details from what they see. They will not notice something that is there to be seen if their cognitive set is "organized" to exclude it.

The conclusions pointed to here are much the same as in the previous examples. First, the stimulus, the thing to which a person responds, is not appropriately identified exclusively with the objective properties of the situation. Second, some mediating processes are necessary in order to adequately formulate the relations between the external situation and the behavior which it induces.

A similar argument can be constructed concerning the perception of logical form. Consider that a central problem that a behaviorist must face in order to develop an adequate view of reasoning is the necessity of dealing with the concept of logical form within the confines of a behaviorist language. Let me explain. Consider the following case. Jones, a logic instructor, says in class, "If grass is green, then it contains clorophyll. Grass is green. Therefore, it contains clorophyll." A student in Jones' class responds, "That's Modus Ponens." Now what has the student responded to? Consider that every situation has almost an infinite number of properties. Objects have shape, color, size location, etc., The idea that some response is linked to or under the control of some stimulus requires us to select from among the properties of some situation those aspects of the situation to which the organism is responding. 'Stimulus' must be treated as a generic term. That is, the stimulus to which a response is linked must be a class of events which are in some respect the same. In order to call two events the same stimulus, we cannot require that they have every property in common. Since it is unlikely that any two events have every property in common, it would follow from such a requirement that an organism never receives the same stimulus twice, and it follows from this that coming under the control of some stimulus is impossible. In order to make sense of the notion of stimulus control or responding to some stimulus, we must select some property or set of properties of a situation as that to which an organism is responding and as defining the notion of 'same stimulus' from occasion to occasion. For example, if a dog is conditioned to respond to a red circle, he may be responding to either redness or circularity. We may decide which experimentally. If he exhibits the required behavior to both red and blue circles, but to neither red nor blue squares, he may be assumed to be responding to circularity but not color. Thus, the stimulus is the property circularity. It is circularity which specifies when two events are the same stimulus.

In the above example, then, what are the properties which define the stimulus to which the expression "Modus Ponens" is the response? The question is answered by asking about the properties a situation would have to have in order to elicit the same response. The answer to this question obviously is that what is being responded to is the logical form of the expression. Thus, one would expect the same response to be given to any expression of the form $p \supset q$, p, therefore, q.

It should be clear that logical categories must also be used to characterize the response variable. Thus, while I shall develop my argument only for the concept stimulus, analogous arguments might be developed for response concepts. That logical form must be treated as a stimulus property has usually been recognized by behaviorists. Skinner comments in Verbal Behavior:

> Rules of logical and mathematical thinking, Laws of Thought, forms of syllogisms, and so on have a related use. The distinction between the logical structure of a sentence and the particular terms which happen to occur in it is the distinction between autoclitic responses (particularly the grammatical frames of Chapter 14) and simple verbal operants. In engaging in verbal behavior which is logical and scientific the speaker slowly acquires skeletal intraverbal sequences which combine with responses appropriate to a given occasion. Just as the poet who has written many iambic pentameters finds it easy to 'think' in that meter, so the logician who has emitted many responses having a given logical structure will find it easy to compose others on the same pattern. He is helped by the fact that fragmentary or skeletal operants combine with other responses in multiple causation and also by the fact that responses which do not have a customary pattern are speedily rejected as awkward and strange.[43]

However, it is one thing to talk this way. It is another to be entitled to. Here we want to ask whether treating logical form as a stimulus property is possible given the self-imposed constraints on vocabulary accepted by many behaviorists.

There are two problems with which any view must deal in attempting to describe and explain what is happening when a person responds to the logical structure of some set of words. First, there is the problem of showing how it is that the logical form of an argument is exhibited in the empirical properties possessed by any instance of this logical form. This is essentially the question of the experiential evidential base for a judgment that some expression (written or spoken) exhibits a certain logical form. When a person looks at an argument and says, "Modus Ponens," it is clear that he is not in any obvious sense merely reporting an observable property of the linguistic entity before him. Consider that the written argument "If grass is green, then it contains clorophyll. Grass is green. Therefore, it contains clorophyll," and the oral

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argument, "If a substance has an atomic weight of 238 it must be uranium. This substance has an atomic weight of 238. Therefore, it must be uranium." have nothing by way of empirical properties in common. First, the empirical properties of the first argument are visual while those of the second are auditory. Second, the arguments have only a few words in common. Of course, they are the key words. Words such as 'if', 'then', and 'therefore' are the stuff out of which logical form is made. However, note that with a little ingenuity one can easily construct instances of Modus Ponens in which even these words do not appear. Logical form, therefore, is not an empirical property of some situation in the way in which red may be an empirical property of an object.

If we are going to treat logical form as an empirical property, it will have to be a very complicated one. Most likely, a property such as Modus Ponens will have to be treated as a rather involved construct out of disjunctively connected observable properties.

This difficulty, however, is a difficulty for any psychology, for, in fact, people do recognize the logical form of some argument solely on the basis of the empirical properties presented in an utterance or in an inscription. Thus, the question concerning the empirical grounds for this sort of recognition is in principle answerable and must be part of any adequate view concerning the psychology of reasoning. If people succeed in recognizing logical form on the basis of the empirical evidence given in the expression of an instance, then that instance must contain sufficient evidence in terms of which such a judgment is made. Further, that evidence must constitute part of the empirical meaning of terms such as Modus Ponens. Thus, the specification of the empirical content of the concept is in principle possible, and since the relation between the concept of logical form and the evidential base for its identification is a logical question not a psychological question in that it concerns the evidential grounds for identifying logical form, not the psychological mechanisms whereby people do this, it is part of the background (the data if you will) of any psychology and, thus, is not apt to differentiate psychologies on any systematic basis.

However, given an adequate view of the relations between the concept of logical form and the empirical meaning of such a concept, the second question--the psychologist's question--concerns how it is that people succeed in recognizing logical form. This is not a question concerning the evidential base of judgments about logical form, but rather a question concerning the mechanisms by means of which these judgments are made. Given that logical form is not a simple empirical property like redness, given that the recognition of logical form requires distinguishing a variety of relevant factors from irrelevant factors and the capacity to recognize the same logical form in a variety of different empirical manifestations, and given that this is clearly

something that people must learn to do, there is a rather complicated set of questions to be answered concerning how it is exactly that they are able to do this. What kind of processes do we need to account for the fact that a person can respond to an argument with the expression Modus Ponens?

It is this second question which is apt to create difficulties for someone committed to a behaviorist theory of concept formation. The centralist is in a comparitively good position with respect to the recognition of logical form. He is entitled to postulate a variety of conceptual structures and information processing devices to account for the capacity. He may work on the problem via a study of neurophysiology or by attempting to construct computer simulations of the phenomena. (A computer able to recognize Modus Ponens might be very informative with respect to understanding some of the structural features of any mechanism, brain structures included, capable of doing the same thing.) In short, the centralist has available to him a rather diverse theoretical inventory from which he may select concepts useful in specifying what is going on when a person succeeds in recognizing an argument as an instance of a certain logical form.

The behaviorist, on the other hand, would seem to be committed to a rather difficult enterprise. For the behaviorist must account for the capacity to respond to a stimulus property such as Modus Ponens without the benefit of this sort of theoretical apparatus. It should be recalled that hostility of behaviorists is not directed at mental states per se but at unobservable states, that is, to any concept which refers to a something which mediates between environmental conditions and behavior. A vocabulary need not contain mental terms to be considered objectionable on such grounds. Any "what's going on inside vocabulary" will be equally objectionable. Skinner suggests this in the following:

> Perhaps no one today is deceived by an "idea" as an explanatory fiction. Idioms and expressions which seem to explain verbal behavior in term of ideas are so common in our language that it is impossible to avoid them, but they may be little more than moribund figures of speech. The basic formulation, however, has been preserved. The immediate successor to "idea" was "meaning," and the place of the latter is in danger of being usurped by a newcomer, "information." These terms all have the same effect of discouraging a functional analysis and of supporting, instead, some of the practices first associated with the doctrine of ideas.[44]

Why exactly would the reluctance to employ a theoretical or mediating vocabulary be such a liability in this

kind of context? To begin simplistically, the answer is that it seems quite obvious that the connection between a stimulus adequately characterized as an instance of Modus Ponens and the verbal response "Modus Ponens" is mediated. That is, whatever it is that one responds to when he responds to the logical form of an argument it is not a manifest property of the empirical situation. One does not see logical form in the same sense in which he sees colors or shapes. He must learn to see it. And learning to see here would seem to require the ability to do something which is easily described as the processing of information. At the least, in order to recognize a property like logical form, a person needs to be able to do two different sorts of things. First, he needs to be able to identify the relevant properties of an empirical situation from the irrelevant ones. Since when one is dealing with a concept like logical form, most of the observable properties are irrelevant, this is no easy task. Second, he must be able to recognize the identified properties as one instance among a rather large number of other instances of properties which constitute sufficient evidence for the presence of requisite logical form.

The conclusion of arguments of this sort is that the stimulus itself--the thing responded to--is driven inward. The thing responded to is not something in the world, some manifest properties of an object. The thing responded to is a mental product, a rather thoroughly processed result of some external events. But even to recognize this is to recognize that the relation between an external event and a response, when the events are of the sort with which we are concerned here, will resist formulation with out the aid of theoretical concepts dealing with the way in which a person's cognitive structure deals with the raw data presented to it.

We may expand on the difficulty by noting that logical form is what I shall call a constructed and abstract property. By a constructed property I shall mean a property which is the product of linking two or more manifest properties together by a logical operator. I shall consider manifest properties to be properties which are directly observable. Thus, colors, sounds, and shapes are manifest properties. I shall also treat spatial or temporal relations between directly observable properties as manifest properties. A constructed property is one which consists in linking together manifest properties by logical relations. Thus, we might define the property X as a conjunction of red and green ($X=R \cdot G$). Logical form is a constructed property in the sense that insofar as the concept is given empirical meaning, it will have to consist in a rather lengthly disjunctively linked series of observations in which a particular logical form is exhibited.

Logical form is an abstract property in the sense that it is rather like the number two in that in a basic sense,

it has no manifest properties at all. Consider that it would clearly be a mistake to infer from the fact that a particular number inscription "2" is black that the number two is black. It does not follow from the fact that a number must be expressed and recognized by means of things which have empirical properties that numbers have empirical properties. The number two is neither one color nor many colors. It is no color. Likewise, a logical form is neither one color nor many colors. It is no color. While an instance of an expressed logical form must have some empirical properties, logical form is not the sort of thing to have empirical properties. It is an abstract thing.

The fact that logical form is a constructed and an abstract property tends to point toward the need for some sort of mediating process in formulating the S-R connections exhibited in logical behavior. There are two reasons for this conclusion. First, there is a sense in which one has to learn to see logical form and this kind of "learning to see" is the sort which seems to require the postulation of some kind of conceptual structure. There is one sense of learning to see in which what is involved can be described as a process of discrimination of manifest properties. A person can learn to see in the sense that he can be gotten to respond more and more selectively to the manifest properties of a situation. I am told that some Eskimos can distinguish an impressive variety of kinds of snow. Insofar as this kind of discriminating involves seeing, it is a kind of seeing which is learned. It is unlikely that the reader (unless he is an Eskimo) will be able to do this. While I would be inclined to hold that even here it would be useful in accounting for this to introduce the notion of a conceptual framework, a behaviorist can plausibly account for the phenomenon by talking about the conditioning of appropriate sorts of responses to ever more refined manifest properties of the situation much in the way that a rat conditioned to respond to a red circle can be gotten only to respond to the circle by a bit of selected reinforcement. But the problem of extending this sort of discrimination account to the identification of abstract, constructed properties is that such properties do not seem to be there in the situation to be discriminated in the way in which manifest properties are there. The identification of something like logical form seems to be more like recognizing that a particular pattern of observable properties fulfulls an antecedently grasped set of specifications, than like discriminating some set of properties which were already there waiting to be discriminated. Modus Ponens, for example, is not a manifest property of an argument in the way in which red is a manifest property of a red circle. It is hard, therefore, to see how one would go about selectively reinforcing a response to it. Indeed, it would seem that there would have to have already occurred a very

complex process of identification or learning to see before a person would be capable of having the proper stimulus to which "Modus Ponens response" might be conditioned. To see an argument as an instance of Modus Ponens is to see it as an exemplification of a certain logical form. But this is to suggest that in order to identify an instance, it is necessary to have already formulated the concept. Learning to see here seems to be a matter of learning to recognize an instance. It is quite reasonable to hold, therefore, that learning to see is a matter of acquiring the requisite concept. It may, of course, be more than that, but it seems that here we have a case where having a stimulus requires having a concept.

Second, when a person responds to the logical properties of an argument, when, for example, he responds with "That's a valid argument" to an instance of Modus Ponens, while some set of empirical properties may elicit the response, he is not plausibly treated as responding to any such set of empirical properties. He is rather responding to an abstract object. Suppose for a moment that a rat could be conditioned to respond to the inscription "7" by pressing a bar. How would we characterize the difference between that and a mathemetician responding with the phrase "That's a prime number?" Clearly, the rat is responding to a mark on a page while the mathematician is responding to a number. That is, the rat is responding to a physical and observable object, a line with a certain shape on a page. The mathematician is responding to an abstract object with a variety of rather complicated logical properties one of which is that it is divisible only by itself and one. The mathematician is not responding to physical things at all. He is responding to something the conceptual and logical structure of which he has grasped. Here again, it seems necessary to introduce mediating devices such as conceptual structures, even to formulate the notion of what is responded to, and here, it is clear that responding to a logical form with a logical response is like a mathematician responding to a number, not like a rat responding to an inscription.

We now have considerable reason to believe that there is tension to be found between the commitments of behaviorism and the theoretical requirements for the construction of an adequate concept of reasoning. Put succinctly, any attempt to incorporate into an account of thinking the kinds of concepts of logical syntax which the construction of concepts such as a logical operation or a reason-explanation demand leads to the use of mediating concepts with a Neo-Kention formation and, thus, turns out to undermine both logical behaviorism and associationism, the two basic features of most behaviorist psychologies. What one would expect to result from such a situation is either that behaviorists attempting to deal with the concept of reasoning would be led to abandon their methodological commitments or that they would be lead to emasculate the concept

of reasoning to fit the requirements of behaviorist philosophy. In fact, as I shall show, one gets a little of both.

Having decided what behaviorists ought to do, it is now time to look at what they have done.

I wish to examine four cases of behaviorist treatments of thinking. The first two will be taken from Skinner, the third from Irving Maltzman and the fourth from D. E.Berlyne. I believe that these different treatments of thinking are paradigmatic of the different ways in which behaviorists have conceived of thinking. I shall try to show that the four views in the order listed provide an increasing adequacy in their concept of reasoning and an increasing abandonment of the commitment to the standard behaviorist viewpoint. (Skinner's second account will prove a bit of a an exception, however.)

We may begin with Skinner's analysis of thinking. In Science and Human Behavior thinking is identified with problem solving. To understand Skinner's concept of thinking, it is, therefore, necessary to understand the concepts of a problem, a solution, and of problem solving. An organism has a problem according to Skinner when it is in a state of deprivation or when it is undergoing some adverse stimuli and when it does not have available any response which will reduce the deprivation or eliminate the aversive stimuli. Skinner describes such a case as one where a response exists in strength which cannot be emitted. This latter description appears to be a way of saying that there is something that the organism could do to eliminate the difficulty, but that the organism does not know what it is.

A solution is defined as a response which alters the situation so that this strong response can be emitted. Problem solving is defined by Skinner as "any behavior which, through the manipulation of variables, makes the appearance of a solution more probable."[45]

Let me first respond to an exegitical problem. I am about to claim that the preceding is a most inadequate formulation of the concept of reasoning. Before doing this, it will be useful to assure ourselves that it is supposed to be an account of reasoning. The concept of problem solving is clearly a broader concept than that of reasoning although it is plausible to assume that it contains the concept of reasoning. We should be clear that Skinner, too, is proceeding under this assumption since we do not want to find ourselves maintaining that his account is an inadequate account of something that it was not intended to be an account of.

I can suggest three reasons which justify treating Skinner's account of problem solving as an account of reasoning. First, Skinner's general task in the section of Science and Human Behavior from which this account is taken is to show that behaviorism can account for "higher" human capacities. Since reasoning is usually thought to be such a capacity, and since Skinner does not treat the topic elsewhere, it is not unreasonable to hold that this treat-

ment of problem solving is an account of reasoning. Second, problem solving seems to be Skinner's word for techniques which help in finding out what to do about something. Clearly, reasoning is such a technique. Third, Skinner attempts to extend his account of problem solving to both syllogistic reasoning and to scientific method. This final fact seems to me to be conclusive. We may then treat Skinner's account as though it were an account of reasoning.

I do not want to claim that there are not cases in which the terms problem and problem solving are used muchin the way that Skinner describes. I do wish to claim that this is not how these terms are used when we are describing anything resembling the activity of thinking or reasoning.

The difficulty with attempting to understand thinking in terms of such concepts is that the notions of a problem, a solution, and problem solving, at least when used to discuss anything properly described as thinking, require for their accurate description a logical vocabulary. A person may have a difficulty when he is in a state of deprivation, but he does not have a problem in the sense of "problem" relevant to discussions concerning thinking until he has put his difficulty into a question. Likewise, one does not have a solution when he has rid himself of a state of deprivation Rather, a solution is the correct answer to a question. The key word here is correct. A solution is something which meets appropriate logical criteria, something which has been adequately verified. One is entitled to claim that he has solved a problem when he is able to show that some proposition is true according to the appropriate canons of evidence and that this proposition answers the question which constituted the problem. A solution is a true answer to a question, not a physiological readjustment. And, of course, that sort of problem solving called thinking is more than doing something to make the elimination of a state of deprivation more likely. Thinking involves the formulation and verification of a proposition. To think is to follow certain logical rules, and thought processes are described in terms of the rules of which they are the following.

The source of the problem here is clearly Skinner's unwillingness to use logical concepts and categories in characterizing the activity of thought. Thus, it becomes impossible to think of thinking as a process whereby evidence is assessed in order to discover whether or not some proposition is true or false. To talk about evidence and verification is to talk about whether or not some set of propositions provide sufficient warrant according to appropriate logical canons for believing some additional proposition. But if we cannot use logical categories in characterizing what a person is doing when he is reasoning, we cannot think of reasoning as having anything to do with the attempt to discover evidence which warrants the acceptance of propositions. Instead, we must conceive of reasoning as a peculiar set of techniques which rid us of aversive stimuli. The normal vocabulary employed to characterize reasoning, the vocabulary which contains words

such as true, false, correct, warranted, evidence, inference valid, deduce and evaluate disappears and is replaced by the mechanistic vocabulary of behaviorism containing words such as aversive stimuli, deprivation, strong response which cannot be emitted, emitting a solution, and manipulating variables.

It will be instructive to see how Skinner extends his account of thinking to syllogistic reasoning. Syllogistic reasoning is compared to the solution of an anagram. Sometimes in solving an anagram, it is useful to rearrange combinations of letters since some arrangements are more suggestive than others. In Skinner's words:

> ...It is helpful to rearrange the available letters since some arrangements may resemble parts of words in the individual's repertoire and hence serve as formal prompts. The experienced anagram player learns to group letters efficiently, especially in certain subgroups which enable him to make profitable larger groups. He learns to put 'q' and 'u' together, to try various combinations of 'sl,' 'sh,' 'sp,' 'th,' and so on.[46]

Syllogistic reasoning (or for that matter mathematical reasoning) is held to be like this. It is a matter of rearranging stimuli so that they become -- well more stimulating. Presumably, the assumption is that the solution to some problem is a piece of behavior which has been conditioned to a set of symbolic stimuli arranged according to a certain pattern. (Of course, to even describe the pattern, it would be necessary to build the concept of logical form into the description of the stimuli.) Skinner's account suggests that the syllogistic reasoner or the mathematical problem solver has the proper symbolic ingredients, but that they are not arranged in the proper pattern. Syllogistic reasoning or mathematic reasoning is then a matter of shuffling these ingredients around until the proper pattern is hit upon. Then the appropriate behavior will be emitted. Skinner's account is as follows:

> ...The logical syllogism is a way of arranging stimuli. The logician possesses a verbal repertoire in which certain conclusions are likely to be made upon the statement of certain premises, but a particular problem may not present itself in the required order. Solving the problem consists of arranging the materials in syllogistic form...the arrangement is made primarily to encourage the appearance of a response which has other sources of strength. In the same way the mathematician is trained to transpose,

> factor, clear fractions, and so on, until an expression appears in a form which suggests a solution.[47]

These accounts of reasoning and its extension into mathematical and syllogistic thought are absurd. They are absurd because they attempt to describe the phenomena of reasoning without the aid of those logical concepts which are the very center of the concept. If the accounts were true, there would be no reason for believing them because they would destroy the concept of a reason for believing. It will be more instructive to inquire as to how Skinner has come to trample so on the phenomena. We do not have far to look for Skinner makes his methodological commitments quite clear at the beginning of the book. Most interestingly, we find expressed a requirement for a functional analysis of behavior. A science of behavior will account for behavior by means of laws connecting behavior with antecedent environmental happenings. Such environmental variables are, according to Skinner, to be described in "physical terms."

It is not unreasonable to suppose that the destruction of the concept of reasoning is a direct consequence of attempting to understand reasoning within the confines of such a conceptual framework. Skinner is clearly attempting to state a view of thought which treats thinking as relations between physically characterized external variables. Undoubtedly, a logical characterization of thinking would appear too mentalistic for a functional account.

Skinner's account of thinking in Verbal Behavior shows a substantial advance in both sophistication and in conceptual adequacy. Consider the following:

> The important properties of verbal behavior which remain to be studied concern special arrangements of responses.[1] Part of the behavior of an organism becomes in turn one of the variables controlling another part...Some of his behavior (the 'known') serves as a variable in control of other parts ('knowing'). Such 'propositional attitudes' as assertion, negation, and quantification, the design achieved through reviewing and rejecting or emitting responses, the generation of quantities of verbal behavior merely as such, and the highly complex manipulations of verbal thinking can all, as we shall see, be analyzed in terms of behavior which is evoked by or acts upon other behavior of the speaker.[48]

Here Skinner at least suggests a willingness to treat the logical form exhibited by a piece of verbal behavior as a stimulus property to which other pieces of verbal

behavior also characterized by their logical form are conditioned. Reasoning is presumed to be a kind of chaining among these verbal behaviors where each response serves as a stimulus for the next. (It is not clear whether these "mediating responses," the ones between the initial stimulus and the final verbal response, are inferential or postulated. If they are not, Skinner's view is easily falsified. Thinking rarely manifests itself in the individual talking to himself. If they are, we have a notable departure from Skinner's methodological pronouncements since it is hard to see given Skinner's constant insistence on the objectionability of manufacturing happenings with just those properties necessary to solve some problem of explanation how such inferred states become acceptable merely because one chooses to call them behavior.)

It is not unlikely that one could construct a reasonable analogue of the concept of a reason-explanation within the confines of the view expressed in Verbal Behavior. We have there the basic required conceptual tools. That is, Skinner is willing to permit the use of a logical vocabulary to characterize the ingredients of a process of reasoning. Indeed, he provides us with a few pages explaining how negation and assertion and appropriate quantifying terms serve to determine verbal behavior. It is not unreasonable to assume that these are intended as examples and that the entire logical vocabulary of any language might be incorporated into Skinner's theory in much the same way.

A Skinnerian analogue of a reason-explanation might, therefore, be expected to look something like the following: Let us suppose that Jones is asked "Is q the case" and responds (not necessarily out loud) "p is the case and p implies q. Therefore, q is the case." The example may be analyzed into the following aspects. There is an initial stimulus, the question "Is q the case?" A response is elicited which also serves as a stimulus to another verbal response, the claim that p is the case and that p implies q. The final response is, then, the claim q is the case.

Given some such account, would it be proper to hold that Jones inferred q from p and $p \supset q$ by Modus Ponens? I suspect that under the proper conditions it would be possible. The conditions would be as follows: Jones may be said to have inferred q from p and $p \supset q$ if:

1. Jones has been conditioned to respond to a stimulus consisting of any set of propositions of the form p. $p \supset q$ with the response q.
2. Jones is presented (including his own verbal behavior) some verbal behavior having the form p. $p \supset q$.
3. Jones responds q.

I believe that this is a plausible behaviorist analogue of a reason-explanation. The state variables in my account of a reason-explanation are beliefs. They have been replaced in the behaviorist analogue by verbal behaviors.

Further, the causal connection between these state variables is described by means of some transformation rule of logic since, in fact, we could not have described the kind of conditioning involved in learning to respond to p. p ⊃ q with q without using Modus Ponens as part of our descriptive vocabulary. We, thus, have a plausible behaviorist analogue of the concept of embodiment of a logical rule. Here, too, a logical concept taken from the propositional calculus is used to construct the non-logical vocabulary of psychology.

If we may for the moment assume the adequacy of this account to explain the data of reasoning, I am prepared to conclude that it raises few problems for the concept of freedom developed in the initial section of this discourse. That is, if I am correct that the most important thing that a psychology must be able to do in order to construct a concept of autonomy is to be able to construct the distinction between a reason-explanation and a mechanistic-explanation, then it follows that insofar as the view of reasoning presented in Verbal Behavior can be used to formulate the distinction it can also express an adequate concept of autonomy. I have suggested before that I believe that psychologists often reject the notion of human freedom not because they are bad psychologists but because they are bad philosophers. I suspect this is the case even with Professor Skinner. If my analysis of the concept of autonomy is correct, given the views of reasoning expressed in Verbal Behavior, there is little reason for Skinner to be as hostile to the idea that men are free as he has been. (It is to be kept in mind, however, that if a theory does have undesirable actual consequences, such consequences may result not only from what follows from a theory but also from what the advocates of a theory believe to follow from it.)

There are, however, some reasons to doubt the explanatory adequacy of Skinner's views. First, Skinner rather uncritically assumes that logical form may be treated as a stimulus property. The fact that logical form is not a physical or observable property of a situation in any very obvious way is not noted. I have tried to suggest that an answer to the question of the recognition of logical form will very likely have to be expressed in centralist terms.

Second, Skinner's account conforms very poorly to the standards of rigor which he has insisted on and to which his earlier laboratory work with animals usually corresponds. One finds in Verbal Behavior no quantitatively expressed laws. There is little which would be of much use in explaining, predicting, or controlling verbal behavior. Indeed, much of Skinner's account seems to amount to a translation of common knowledge about language and reasoning into the vocabulary of behaviorism at the price of a good deal of conceptual obscurity. As Chomsky has noted:

> ...if we take his terms in their literal meaning, the description covers

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> ...if we take his terms in their literal meaning, the description covers

> almost no aspect of verbal behavior, and if we take them metaphorically, the description offers no improvement over various traditional formulations. The terms borrowed from experimental psychology simply lose their objective meaning with this extension, and take over the full vagueness of ordinary language. Since Skinner limits himself to such a small set of terms for paraphrase, many important distinctions are obscured.[49]

By way of illustration here suppose we ask ourselves whether the sort of account that Skinner offers of reasoning does have much by way of predictive utility. Suppose we went up to someone and said, "If grass is green, then it contains clorophyll. This grass is green." He might just as likely say, "Huh" or "What's this all about?" or "Did you lose a bet?" or "Actually, the grass is brown at this time of year." There is little in Skinner's account which would enable us to make adequate predictions in such cases. Of course, post facto explanations are easy. If the person says "This grass contains clorophyll," we may safely hold that his behavior is under the control of the stimulus property of the logical form of the propositions. If he says "Huh" or "What's this all about," we may assume that "out-of-contextness" of the event was the controlling stimulus property. If he tells us how brown the grass is now, we may assume that verbal behavior is partly under the control of the present color of grass.

It is hard to see how this procedure is an improvement over traditional mentalist explanations. Indeed, it exhibits what Skinner regards as their chief defect. Explanatory concepts are invented after the fact and are given just those properties needed in order to account for the phenomenon. Chomsky comments on the procedure as follows:

> ...If we look at a red chair and say red, the response is under the control of the stimulus redness; if we say chair, it is under the control of the collection of properties (for Skinner, the object) chairness (110), and similarly for any other response. This device is as simple as it is empty. Since properties are free for the asking (we have as many of them as we have nonsynonymous descriptive expressions in our language, whatever this means exactly), we can account for a wide class of responses in terms of Skinnerian functional analysis by identifying the controlling stimuli. But the word stimulus has lost all objectivity in this

> usage. Stimuli are no longer part of the outside physical world; they are driven back into the organism. We identify the stimulus when we hear the response. It is clear from such examples, which abound, that the talk of stimulus control simply disguises a complete retreat to mentalistic psychology. We cannot predict verbal behavior in terms of the stimuli in the speaker's environment, since we do not know what the current stimuli are until he responds. Furthermore, since we cannot control the property of a physical object to which an individual will respond, except in highly artificial cases, Skinner's claim that his system, as opposed to the traditional one, permits the practical control of verbal behavior[7] is quite false.[50]

Finally, while Skinner does provide an account of reasoning which I believe would permit him to distinguish between procedures which change a person's opinion or behavior in rational ways as opposed to those which do not involve persuasion or appeal to evidence, he does not tend to describe his own research or writing in that way. Thus, instead of trying to discover evidence which would confirm a theory about verbal behavior, we find that Skinner has read books and articles which have "generated verbal tendencies."[51] Materials were then arranged so that they effected "a minimal repertoire"[52] although more hopefully we read that "I have tried to conform to the special reinforcing contingencies of the scientific community in the representation and analysis of these relationships"[53] Concerning the reader, we find that "I have as it were put the reader through a set of exercises for the express purpose of strengthening a particular verbal repertoire....I have been trying to get the reader to behave verbally as I behave."[54]

It appears, therefore, that while Skinner may have the conceptual equipment to talk about evidence and persuasion, and to distinguish these from other devices whereby the readers' verbal behavior might be altered, he nevertheless continues to describe what one would hope to be such processes in a highly mechanistic fashion. One can only conclude that human thought remains a rather problematic phenomenon for Skinner's brand of a "science of behavior."

The third account of thinking to be considered is taken from an article by Irving Maltzman entitled "Thinking: From a Behaviorist Point of View." Here, as with Skinner, thinking and reasoning are identified with problem solving. Maltzman attempts to explicate this concept by means of an

extension of Hull's concept of a family habit hierarchy. The keys to this concept are the concepts of divergent and convergent mechanisms. A divergent mechanism is one in which a particular stimulus has varying tendencies to elicit alternative responses. That is, more than one response has been conditioned to a single stimulus. These responses may be ranked in a hierarchy on the assumption that the strength of the conditioned responses differ so that there is an order of dominance among the responses. A convergent mechanism is similarly one in which alternative stimuli have varying tendencies to elicit the same response. Divergent and convergent mechanisms can become linked together to provide what Maltzman calls a family hierarchy, and several family hierarchies may be combined to produce what is called a compound family hierarchy. Complicated as all of this sounds to someone unfamiliar with the central concepts, it will be sufficient for my purposes to think of a compound family hierarchy as a set of habit chains arranged in some order of dominance. Problem solving or thinking can, then, be described in terms of the ways in which the order of dominance among these chains changes. Maltzman, thus, provides the following account of the concepts of productive and reproductive thinking:

> The occurrence of reproductive thinking in situations where only a single problem is presented is also the consequence of the factors outlined. As a result of past training the dominant habit family in the compound hierarchy contains the correct response. Solution of the given problem depends upon extinction of the initially dominant incorrect responses within this one hierarchy.
>
> In productive thinking, on the other hand, a habit family initially low in the compound hierarchy must become dominant before a correct solution can be attained. This occurs as the result of the extinction of the dominant incorrect response hierarchies. Once the appropriate habit family is dominant a solution will occur, provided that the correct responses within that hierarchy in turn become dominant.[55]

The following observations are called for concerning Maltzman's views. First, I think that it is clear that compared with Skinner's initial account of thinking, Maltzman's view represents a notable advance. It is more theoretically sophisticated. It distinguishes between various types of thinking, and it provides a plausible mechanism, the operations of which could account for these different kinds of thinking. Maltzman's account is sufficiently complicated that it could plausibly account for a

variety of different sorts of behavior while at the same time it is sufficiently precise that it might conceivably be rendered experimentally testable. Skinner's account on the other hand is neither complicated nor precise. It is almost inconceivable that Skinner's account could be employed in generating predictions about what a person would actually do given a problem solving situation. Maltzman seems to have inherited from Hull a good sense of what an adequately formulated explanation is supposed to be able to accomplish.

It is of interest to note that his increase in theoretical sophistication is purchased at the price of abandoning logical behaviorism. Matzman is quite clear about this.

> ...According to the present systematic position, thinking is a defined concept or hypothetical variable. The specific definition that is given to it is the problem of theory, and will be discussed presently. Now we must explore further the consequences of the assumed systematic status of the concept. For one thing, thinking is not a response, verbal or otherwise, just as learning is not a response, and just as electricity is not the temperature of a conductor. All of these are dispositional concepts that are given empirical meaning by statements referring to their antecedent as well as their consequent conditions (Carnap). They are not equivalent to their manifestations or consequent conditions. The insistence that thinking <u>is</u> a verbal response, a contraction of certain muscles, or activity in the central nervous system, is thus based on an inappropriate use of language.[56]

It will serve my purposes adequately at this point to simply note that this is an important concession. As I shall show in III C of this report, the abandonment of logical behaviorism is an important ingredient in developing a view of the expression of educational objectives which will not prove corosive of many worthwhile educational goals.

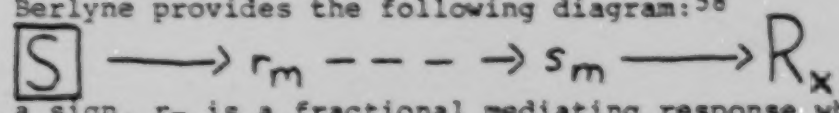
Despite its increase in sophistication, Maltzman's view of thinking shares the central defect of Skinner's initial formulation. It fails to deecribe thinking interms of appropriate logical concepts. The concepts of a problem and of a solution are understood in good Hullian fashion in terms of drives and drive reduction. The correct response appears to be the one which succeeds in reducing some drive. Problem solving, thus, seems to have nothing to do with verification, collecting evidence, or discovering true answers to questions. Maltzman does at one

point make the hopeful remark that the kinds of mediation which his theory requires seem to depend on language, but this suggestion is not amplified. We may, therefore, conclude that Maltzman's account falls short of what is required for an adequate explication of the concept of thinking.

The final view which I wish to consider has been developed by D. E. Berlyne in an article entitled "Knowledge and Stimulus-Response Psychology." We may begin the account of Berlyne's view by referring to Osgood's definition of a symbol which seems to provide the key concept for Berlyne's view of thinking. Berlyne quotes Osgood's definition as follows:

> ...a pattern of stimulation which is not the object is a sign of the object if it evokes in an organism a mediating reaction, this (a) being some fractional part of the total behavior elicited by the object and (b) producing distinctive self-stimulation that mediates responses which would not occur without the previous association of non-object and object patterns of stimulation.[57]

Berlyne provides the following diagram:[58]



S is a sign, r_m is a fractional mediating response which produces (is?) a mediating stimulus which in turn elicits overt behavior, R_x. r_m is identified as a concept or meaning.

Berlyne develops his view of reasoning by means of a series of levels of complexity of S-R bonds. The following is a somewhat simplified description of the six levels Berlyne provides:

1. Reaction. A reaction seems to be merely some R_x which is conditioned to either an internal or external stimulus.

2. Reintegration occurs when, given two closely conjoined stimuli S_1, S_2, S_1 or s_1 (the proprioceptive stimulus resulting from R_1) become conditioned to a fractional component of R_2.

3. Symbolization occurs when (a) s_1 is sufficient without S_1 to evoke the fractional component of R_1 and (b) this fractional component can occur without S_2. In effect, at this stage an external S-R bond has been replaced by an internal s-r bond which is capable of forming chains. Thus, at this stage a series of mediating responses, r_m, consisting most likely of subvocal verbal responses or perceptual responses may occur.

4. Ramification occurs when S_1 or s_1 can initiate several habit sequences and, thus, initiate more than one series of r_ms (which series depending on other considerations).

5. Reorganization occurs when symbols are no longer tied to chronological order thus making possible novel combinations of the sort suitable for problem solving.

6. Ratiocination occurs in Berlyne's words when the organism has learned to perform "only such symbol sequences as fulfill certain conditions ("rules of logic") which are necessary to ensure their stability and consistency."

The most notable feature of Berlyne's view for my purposes is that it does quite explicitly incorporate the concept of following a logical rule as part of the description of thinking and, thus, does contain the requisite conceptual equipment out of which the distinction between a reason-explanation and a mechanistic-explanation can be constructed. It is, I might add, the first of the views we have considered which seems to have anything resembling an adequate grasp of the phenomena with which it is attempting to deal.

It does seem, therefore, to be possible to construct within the confines of behaviorist psychology a view of thinking in which the appropriate logical concepts are employed. In fact, however, this is not as clear as it might first appear. I wish to suggest that by the time Berlyne has gotten to the stage of ratiocination he has largely abandoned the central doctrines of behaviorism (while retaining much of its verbal form). The reader will recall that I earlier identified two of the central doctrines of behaviorism as a strict theory of concept formation and associationism.

The strict theory of concept formation or its psychological version, logical behaviorism, is quite clearly abandoned by Berlyne. Initially, he suggests that his account will make use of dispositional concepts or intervening variables, language which suggests that perhaps Berlyne believes that his concepts are eliminable in some observation language. (The use of terms such as disposition and intervening variables is not sufficiently standardized to warrant any assurance here.) Nevertheless, it is obvious that concepts such as fractional response, given the way in which they are employed in the theory, are inferred entities, entities whose existence is postulated because the existence of such an entity appears to be necessary to account for the data. To say that an entity is inferred or postulated is, of course, to say that while such an entity may be identified by means of some observations and while propositions about such entities may be confirmed by experience, the meaning of terms referring to such entities cannot be exhausted by these experiences. Thus, Berlyne's mediating stimuli and mediating responses are theoretical entities.

It may be appropriate at this point to express parenthetically a degree of puzzlement at the pliability of behaviorist logic concerning the rationale of the employment of an S-R vocabulary. I have already tried to argue that the commitment to construct psychological theory in

terms of associative bonds between stimuli and responses is largely the result of philosophical ideals. The use of terms like stimuli and response has been argued for as preferable to mental, cognitive, and even neurophysiological concepts on the grounds that a stimulus and a response are the sorts of things which can be directly observed. They need be neither inferred nor introspected. Likewise, the concept of an association can be argued for in such terms. In a sense, association is a kind of anti-concept. It serves to note that a stimulus and a response are linked without noting how they are linked and indeed often precludes the introduction of further concepts to account for the linkage. Associationism can also, therefore, be treated as an aspect of logical behaviorism. S-R psychology, therefore, both historically and logically has as part of its background an ideology which precludes the use of inferred or theoretical entities in psychological theory.

It is a bit surprising, then, to find that stimulus and response themselves have come to be employed as theoretical entities. It appears as though for many behaviorists the use of the sanctified vocabulary has proved to be a kind of conceptual holy water to wash away the methodological transgression.

Skinner again provides a handy illustration. Allow me again to quote this passage from Verbal Behavior:

> Perhaps no one today is deceived by an 'idea' as an explanatory fiction. Idioms and expressions which seem to explain verbal behavior in term of ideas are so common in our language that it is impossible to avoid them, but they may be little more than moribund figures of speech. The basic formulation, however, has been preserved. The immediate successor to 'idea' was 'meaning,' and the place of the latter is in danger of being usurped by a newcomer, 'information.' These terms all have the same effect of discouraging a functional analysis and of supporting, instead, some of the practices first associated with the doctrine of ideas.[59]

What is the problem with 'idea,' 'meaning,' and 'information'? Skinner's claim is that, "The difficulty is that the ideas cannot be independently observed."[60]

In Science and Human Behavior, we find in a chapter entitled "Private Events in a Natural Science," the interesting claim that private events, i.e. events which take place within an organism's skin, are quite acceptable in a science of behavior. According to Skinner, "We need not suppose that events which take place within an organism's skin have special properties for that reason."[61] Is that

the case? Can we treat an internal stimulus or response as observable in the sense of observable that behaviorists have been inclined to insist upon?

Initially, it should be remarked that in principle Skinner is correct. There is nothing inherently objectionable or unobservable about an event which occurs under the skin. Empiricist arguments which require the observability of the referents of scientific terms have usually been careful to specify that observable means observable in principle. To use an outdated example, the other side of the moon is not unobservable merely because we lack the technology to see it. It is observable in principle, i.e., if we had the technology, we could see it. Likewise, there is no reason to deny to the behaviorist stimuli which are observable in principle even though we do not as yet have the technology to observe them. So long as such events are not known solely by introspection or are not solely inferred or theoretical concepts, there is no reason to deny them to the behaviorist.

Are these unseen events observable in principle in the requisite sense? Let us look at some examples. Included in Skinner's list are "the stimulating effect of an inflamed tooth" (I shall assume that this expression is a euphemism for "toothache"), interoceptive and proprioceptive stimuli, and "covert behavior." To illustrate the latter, Skinner at one point claims that the expression "I was on the point of going home" may be the equivalent of "I observed events in myself which characteristically precede or accompany my going home." Other theorists have added to the list various kinds of covert happenings explicitly designed to mediate between observable happenings. Such "entities" as the fractional anticipatory goal response are paradigmatic.

Do these sorts of happenings meet the requirements of observability in principle? For several, if what one means by observability in principle is intersubjectively observable, the answer is clearly no. The toothache will serve as a paradigm. Let us ask exactly what techniques of observation or what advances in the technology of psychological instrumentation would enable us to see someone else's toothache. Isn't it quite clear that no conceivable advance would suffice? Skinner has mistaken the sense in which pains (feelings in general) are private. The kind of privacy that they have has little to do with their spatial relation to the skin. (Indeed, where is a toothache located? In a tooth? Then where is the itch that an amputee may feel in his missing foot?) Pains and feelings are logically private. That is, they are not the sort of thing which could be shared. They are not intersubjectively observable. Indeed, the kind of observation with which one seems to observe his own pains and feelings seems suspiciously like that old villain of behaviorist psychologists, introspection.

Skinner's claim that we may respond to events going on within ourselves, the kinds of things which might fill the specifications of something which characteristically precedes my going home, is most interesting. First, this seems to be an introspective observation. Second, it is false. That is, "I was on the point of going home" is rarely a report of some inner events which one characteristically observes prior to going home. The reader should ask himself what events of this sort does he usually experience before going home. Does one need any such events to know where he is going? Skinner could, of course, retreat to the position that such events need not be experienced in order to have occurred and to have been responded to. Such a retreat has the difficulty of leaving Skinner with an obviously inferred event and (from his viewpoint) a methodological disaster. He has invented a cause.

Similar things can be said about mediating events such as the fractional anticipatory goal response. It can be maintained that referents for such happenings can be found and that, thus, they need not be purely inferred entities. The history of attempts to find such referents has been to my knowledge a bit checkered. It is, perhaps, of more interest to note that such entities were invented prior to any attempt to find empirical referents for them. They were invented to solve various problems in behaviorist theories, and they are retained in behaviorist psychologies regardless of whether investigation yields observable evidence for such covert happenings.

In fact, the author objects not in the least to such postulated entities so long as they are included within a theoretical framework which permits the testing of the assertions in which they are employed. Science proceeds by inventing entities and giving them the properties necessary to explain the observed data. What I find surprising is that behaviorists continue to restrict their scientific language to the terms stimulus and response while proceeding to employ these concepts in ways which involve a rejection of the doctrines which originally gave rise to the behaviorists' vocabulary restrictions. The maintainance of such a commitment is all the more surprising when it becomes evident that much of behaviorist theory construction amounts to little more than an attempt to translate the concepts of a cognitive psychology into S-R terms, that this is done with a cost of considerable expressive capacity and with some violence to the S-R concepts themselves, and that no gain in predictive or explanatory capacity has been shown to result thereby.

Let us return to Berlyne.

Not only has Berlyne apparently abandoned logical behaviorism, but the concept of an association is seriously emasculated. In order to work out the details of this claim let me note some features of the concept of an association. The central idea of an associationist psychology is

that what a person learns is a connection between a stimulus and a response. The view which is typically and appropriately opposed to this notion is that what one learns is some cognitive structure of which behavior is a function. On the former view, a specific behavior is acquired as a response to a specific stimulus. On the latter view, the person may often be regarded as having acquired a concept, rule, or schema which specifies properties which exhibited behavior must satisfy. On the latter view, behavior is a function of the interaction of the environment and a specific cognitive structure.

I want to suggest that this kind of opposition is part of the background of the meaningfulness of the concept of an association. That is, the concept has some negative logical features in that it excludes the use of cognitive schema, rules, concepts, and the like as mediating events between the stimulus and the response. For to employ such concepts is to deny that learning consists of forming connections between a specific stimulus and a specific response and to hold instead that learning is a matter of acquiring the ability to exhibit behaviors which accord to the specifications of some rule or schema under appropriate circumstances and, therefore, to introduce such concepts as mediating concepts is to deny that what one learns is behavior and to affirm instead that what one learns is a cognitive structure of some kind.

If this is the case, we may then want to inquire as to whether when Berlyne claims that in ratiocination "the organism has to learn to perform only such symbol sequences as fulfill certain conditions ("rules of logic") which are necessary to ensure their stability and consistency," he has not simply abandoned an associationist point of view. Once we start talking about performing symbol sequences which satisfy the rules of logic is that not to say that the stages in such a sequence are not connected by laws of association but instead are connected in the way they are because they fulfill the specification of the appropriate rules? Berlyne has, in fact, held that in ratiocination, the person is engaging in rule-following acitivity, and unless we are willing to make the concept of an association vacuous, that claim is incompatible with holding that the connections between the symbols in a symbol sequence are associative.

How might this objection be avoided? We may explore two possibilities. First, it could be held that the difficulty can be dissipated by distinguishing two levels of description such as I earlier distinguished between a logical and a mechanistic description of a computer. If it is plausible to suggest that a logically characterized sequence of events can be modeled in a physical and mechanistic system such as the circuitry of a computer or a neurophysiological system, perhaps it is also plausible to suggest that the sort of system described by an

associative psychology is capable of serving as a mechanistic model for a logically characterized sequence of events.

This is, I suspect, a plausible but not a workable response. For a logical description of a system to be modeled by a mechanistic system, it is necessary for there to be a mapping of the logical relations exhibited by the former into the physical structure of the latter analogous to the way in which pieces of information can be mapped into the holes in a punch card or to the way in which logical operations can be mapped into the circuitry of a computer. The requirements for such a mapping seem to be some degree of structural isomorphism and a kind of mechanical dictionary whereby mechanical happenings are translated into a logical description. To my knowledge no such mapping relationships have ever been proposed by behaviorists (substantial effort in this direction has been done concerning relations between cognitive concepts and neurophysiological structures) nor is it particularly clear how one would proceed on such an enterprise.

Note, indeed, that the kind of S-R description of ratiocination which Berlyne provides does not specify any physical structure. Rather it appears to be an attempt to state a logical characterization of a process of reasoning in a mechanistic vocabulary. Because it does not specify any physical structures and because it is itself a kind of logical description, Berlyne's account cannot be understood as an attempt to provide a mechanistic model of a logically characterized sequence of events.

A second strategy to salvage a meaningful concept of associationism could be developed by claiming that the sequence of symbols which comprise a chain of thought accords with some rule, but is not a result of following the rule. The distinction may be illustrated by an example taken from the game of chess. Let us suppose that a small child, ignorant of the rules of chess, picks up the rook and the king and moves them in a way which satisfies the rules for castling. Since the movements of the pieces satisfy the rules, we are entitled to claim that the child has done something which accords with the rules of chess; however, since the child was ignorant of the rules to which his movements accord, we cannot say that he was following the rules. To say that a person is following a rule, it is necessary to hold that a grasp of the rule is part of the explanation of the behavior. When someone who understands the rules of chess performs the act of castling in a game of chess, he is following a rule. That is, he does what he does because among other things he sees the movements as satisfying the rule for castling. Thus, understanding the rule enters into an account of the behavior.

Now suppose that we understand "the organism's learning to perform such symbol sequences as fulfill certain conditions ("rules of logic")" as equivalent to the view

that the organism learns to exhibit behavior which accords with the rules of logic; will this help to maintain a viable, non-vacuous concept of association? The answer is yes. As long as we do not hold that grasping a rule is part of the explanation of the symbol sequences, we are free to hold that having formed associations between these symbols is the explanation. There are, however, two problems. First, the concept of a reason-explanation is sacrificed in this ploy. The concept of a reason-explanation is constructed on the assumption that following logical rules is part of the explanation of reasoning activity. Second, the solution is impossible. Since the organism cannot determine whether a symbol sequence is acceptable by applying the rule of logic to it, it follows that it is necessary to learn each symbol sequence which accords to a certain rule independently of all the rest. After all, satisfying a particular rule is the only property that different propositions which satisfy a rule have in common. Understanding the rule appears to be a condition of transfer from one instance of the rule to the next. Unfortunately, for each logical rule, there are potentially infinite numbers of sets of propositions which satisfy it. Thus, learning each of the instances of a rule is impossible. What follows is that the claim that the symbol sequences which comprise trains of thought accord with rules, but are not the result of following rules makes it impossible to explain what people quite commonly do; that is, to construct novel symbol sequences which satisfy a logical rule.

The conclusion to be drawn from these arguments is quite simple. It is that Berlyne has paid as a price for introducing logical concepts into his account of thinking the abandonment of the characteristic doctrines of behaviorism. Both logical behaviorism and associationism are gone. What remains of behaviorism by the time Berlyne has gotten to ratiocination is largely its verbal form. I do not think it unfair to conclude that instead of showing that higher human capacities can be accounted for within the confines of behaviorist theory, what Berlyne has done is to show that by stretching the concepts of behaviorism to the point where they become largely vacuous, one can succeed in employing them to redescribe some quite commonplace phenomena.

Summary and Conclusions

In the first major section of this inquiry we were led to the conclusion that there was a logical connection between the concepts of freedom and reason. It was maintained that to discuss the compatibility of freedom and a science of psychology as an issue about whether there were uncaused events was wrong headed, and instead it was maintained that more interesting results could be obtained by studying the ways in which various psychologies treated the concept of reasoning or thought. The distinction

between a reason-explanation and a mechanistic-explanation was noted as crucial in this context.

The first portion of this section is summarized by three claims:

1. Logic provides the criteria according to which the adequacy of a process of thought is judged.

2. Thinking is defined as a process which is described by a vocabulary which embodies logical rules. Such a vocabulary was characterized as one in which logical terms were employed to characterize psychological states or processes.

3. It was held that E is a reason-explanation of some belief that p iff E contains an embodied argument for p. A mechanistic-explanation was any explanation that was not a reason-explanation.

The second portion of this section is summarized as follows:

1. Paradigmatic cognitive psychologies offer little difficulty in regard to formulating a concept of a reason-explanation within their confines in that (a) most cognitive psychologies contain the logical ingredients of such a concept and (b) the theory of concept formation assumed by most cognitive psychologies is sufficiently permissive to formulate the notion of a reason-explanation.

2. Behaviorist psychologies were held to be more problematic. Behaviorism was defined in terms of two doctrines which I called logical behaviorism and associationism. It was held that (a) there are theoretical reasons why logical behaviorism tends to have difficulty formulating an adequate concept of thinking or the concept of a reason-explanation, and (b) that particular behaviorist theories of thinking tend to abandon both logical behaviorism and associationism to the degree that they succeed in formulating an adequate theory of thinking.

These results indicate that in the next section when we give attention to particular educational concepts, ideals and programs it will be useful to pay close attention to those educational theories which have their roots in behaviorist concepts. In the language of the introduction, we now have reason to suspect that they carry some unwanted conceptual baggage.

SECTION III: And Education

The first two portions of this report gave rise to two major conclusions.

1. There is a link between the concepts of freedom and reason.
2. Behaviorist psychologies have substantial difficulty formulating an adequate conception of reasoning.

These results indicate that a plausible approach to investigating the conceptualization of freedom in education is to inspect the effects that behaviorist inspired ideas have on educational ideals and educational programs. It is my intention to attempt such an investigation in what follows.

It is not, however, possible to conduct such an investigation empirically. This is the case for three reasons. First, the kinds of effects in which I am interested are in many cases long term and indirect. In part I am concerned with the capacity of behaviorist notions of man to undermine or redefine some standard ethical concepts which may in time change markedly the ways in which human beings treat each other. Such changes often require many years before they become noticable. Second, behaviorist programs in education are rather new. They have not been around long enough to have generated sufficient consequences for study. Third, unfortunately for purposes of serious scholarship most of what I shall call "behaviorist inspired" educational programs are ideologically impure. That is, they rarely involve the consistent application of pure behaviorist theory in an educational situation. More often they tend to be curious mixtures of behaviorist dogma, concepts from research methodology, confused philosophy, political slogans, and common sense. (The literature on behavioral objectives provides an obvious example.) It is thus almost impossible to consider the consequences of such programs as providing hard evidence about the likely effects of behaviorist ideology in education.

Instead of attempting any review of the actual consequences of behaviorist programs, I shall in what follows attempt a kind of gedanken experiment. Two central questions will be addressed.

1. What are the consequences of certain behaviorist concepts of reasoning for the conceptualization of educational goals and methods?
2. What are the reasonable outcomes of consistently applied or "pure" behaviorist programs?

The first of these questions is a strictly conceptual one. It is intended to explore some of the conceptual commitments and presuppositions of certain educational goals and methods. Nothing follows about what people will actually do. People are quite capable of acting on ideals

while at the same time accepting views about human nature or human behavior which render these goals untenable. It is quite plausible that should a conflict between some prized ideal and some behaviorist view of man arise, it will simply not be recognized and either the educational ideal or the behaviorist viewpoint will be unintentionally abandoned. Thus, for example, should a conflict arise between the desire to express educational goals in a behaviorist language and some prized goal which proves recalcitrant to expression in such a language, the educator may respond by emasculating the goal or by abandoning the commitment to behavioral objectives while maintaining the verbal trappings of the commitment. Neither strategy need occur consciously or intentionally.

The second question appears to be more of an empirical one, but, in fact, it is not. I do not intend the inquiry into the reasonable outcomes of a consistently applied behaviorism to be an exercise in the prediction of behavior. Rather it is an exercise in practical reason. That is, I am not trying to predict what a person who holds certain behaviorist opinions will do. I am trying to decide what acts are warranted by a behaviorist orientation. Thus, the second question concerns the educational consequences which follow from behaviorist ideas. To move from this sort of exercise in practical reason to a prediction of actual behavior and actual consequences requires the assumption that people will act in ways consistent with their beliefs. That is, of course, frequently not the case, and in the course of the argument I shall suggest some reason for suspecting that it will not be the case with respect to behaviorist inspired educational programs.

To successfully perform such a gedanken experiment it will be useful to have a point of view for the sake of contrast. I am going to try to show that behaviorist views tend to undermine (among other things) an acceptable view of the role of freedom in education. In order to do this it will first be necessary to suggest something of what an acceptable view of freedom in education is like. The reader should be put on notice, however, that I am not going to reject behaviorist inspired views of education merely because they happen to conflict with my opinions about what education should be like. Rather I am going to try and show that behaviorist views tend to undermine alternatives in suspect ways. I shall claim that behaviorist views tend to reject meaningful goals and plausible means to these goals, not on the basis of any empirical facts, but merely because these ends and means tend to be inexpressible within the confines of behaviorist views concerning acceptable scientific language. To accept my case here it will not be necessary to accept my view of freedom in education as true. It is enough to consider

it plausible; that is, as consisting of intelligible goals and empirically testable theories about how to achieve these goals. My purpose here is not to affirm my own view, but to liberate the discussion of the issues from arbitrary behaviorist metaphysics.

A. A Concept of Freedom in Education

The question I shall address concerns the kind of educational environment which is appropriate to an education which has as a major goal the creation of free persons. It will be useful to begin by distinguishing two sorts of freedom which I shall call liberty and autonomy. Liberty may be considered as the ability to do what one wants or alternatively the absence of constraints on one's actions. A person has liberty with respect to action, A, iff he can do A if he wants to. Autonomy is psychological freedom. It is the sort of freedom one has when he acts as opposed to being acted upon, when his wants and beliefs are chosen by him rather than chosen for him, when he is psychologically capable of self direction and independent action. Autonomy is often the sort of thing that psychologists mistakenly tell us we don't have because we are determined.

It is, of course, autonomy with which we are largely interested in this document. Now if we are to consider autonomy as a goal of education and decide how to proceed to create autonomous people it will be necessary to unpack the concept a bit. We have to know what the components of autonomy are so that we can begin to identify the sorts of skills and attitudes on which autonomy depends. A clue as to how to proceed here may be taken from the final pages of the first section. Here two of the points argued were:

1. There is a logical connection between freedom (or autonomy) and reason.
2. People are free to the degree that their behavior is (or could be) explained by a reason-explanation and are not free to the degree that their behavior is explained by mechanistic explanations to the exclusion of reason-explanations.

The question concerning autonomy can, then, be posed as a question concerning the properties necessary for a person to possess if he is to be the sort of person whose behavior is likely to be explained by a reason-explanation rather than a mechanistic explanation. This question in turn may be approached by asking what traits we might expect an autonomous person to exhibit. The following list provides something of the range of possibilities. An autonomous person

1. tends to base his decisions and actions on available evidence.
2. tends to alter his behavior when the available evidence on which the behavior was based changes.

3. tends to have his needs, especially his psychological needs, function more as evidence for what his decisions ought to be than as "direct" determinants of his decisions.
4. is not easily manipulated or deceived.
5. is psychologically capable of accurate perception of external events.
6. tends not to distort reality to conform to neurotic needs.
7. tends not to be easily lead by appeals to an unrecognized self concept.
8. tends not to be defensive.
9. tends to have an accurate perception of his needs and abilities.
10. tends to have an accurate self concept.

Traits (1), (2), and (3) form what I believe to be the center of the concept of self direction or autonomy. In essence, an autonomous person is one who tends to respond to the world including his inner psychological world, especially his needs, as evidence for what he should do. His external and internal environment provide reasons which govern his behavior. Thus, while the environment of such a person surely does effect the person's behavior, he does not respond in mechanical fashion to it. The kinds of explanations which connect the environment to the behavior are reason-explanations, not mechanistic explanations.

Traits (4) through (10) suggest some of the kinds of things which tend to indicate that a person is not responding to the environment as evidence or which render him incapable of responding in such a fashion. People who are neurotic or defensive or who have some unrecognized ego ideal tend to be easily manipulated or to distort reality to correspond to their neurotic needs. To the degree that people do such things, they are not responding to their environment as evidence for their decisions or actions.

These traits suggest that an autonomous person is one to whom two sorts of properties can be ascribed, one positive kind and one negative kind. On the positive side, a person who is autonomous possesses what I shall call evaluative skills and attitudes. Evaluative skills and attitudes are those which enable a person to successfully base his decisions and behavior on available evidence. On the negative side the autonomous person does not possess what I shall term obstructive traits. Obstructive traits are whatever traits a person may have acquired which result in the inability of the individual to apply whatever evaluative skills and attitudes he may possess in actual choice and action. Paradigmatically obstructive traits are neurotic or psychotic tendencies (or just plain "hang ups") which induce defensiveness, a tendency to distort or reject painful information, an unrealistic self-concept or a mistaken assessment of one's real needs, or which otherwise

prevent a person from performing an adequate act of evaluation or from acting on such an evaluation. The lack of such deficiencies is close to what is commonly termed mental health.

There are, I believe, at least two major classes of evaluative skills and attitudes. First, since reasoning or evaluating is a rule-governed act, to perform an act of reasoning, to respond to some environmental happening as evidence, requires having learned the rules whereby proper reasoning is conducted. For example, assuming that one knows that if grass is green it contains clorophyll, it is not possible upon noting a particular patch of green grass to discover that it contains clorophyll unless one has a functioning grasp of Modus Ponens. The world can be evidence for belief or action only insofar as we know the requisite rules of logic. (It will be useful to recall here first that in this context to know a rule is to be able to use it rather than to be able to formulate it. Second, since there are innumerable logical rules and since undoubtedly most people can use some of them and no one can use all of them, autonomy as far as it is linked to one's reasoning capacities will be a property susceptible of degrees.) In this context the concept of logic should be employed in the widest possible sense. Thus, it would include not only rules of inductive and deductive logic, but also whatever heuristic rules (rules for the generation of hypotheses) there may be as well as rules governing moral evaluation and decision making and whatever rules of informal reasoning there may be. Nor need such rules be purely formal. Substantive concepts, facts, or theories, insofar as they function as tools of thought should be included.

The second sort of evaluative skills and attitudes involves whatever affective traits which may be necessary to or aid in a person's ability to maintain a rational stance toward thought and action. Undoubtedly such affective traits as self-esteem, self-confidence, confidence in one's judgment, and a belief in the merits of a rational orientation toward life are essential properties of the sort of person who succeeds in responding to the world as evidence.

All of us know people who seem on occasion to exhibit a high degree of skill or ability insofar as the ability to correctly derive conclusions from premises is concerned, but who nevertheless have considerable difficulty bringing their abilities to bear on ordinary domains of existence. Such people would hardly be considered autonomous. Examples of this sort suggest two things. First, they suggest that the acquisition of evaluative skills is necessary, but not sufficient for autonomy. Second, since a person may possess such skills to a considerable extent yet fail on occasion to bring them to bear in the most elemental situations, our conceptual framework for autonomy seems to

require some concept to serve the function of explaining how possessed skills fail to come into operation on certain occasions. That is, we need to think of some aspects of a person's psychological makeup as obstructing or inhibiting the operation of possessed rational or evaluative capacities. Neurotic or psychotic tendencies seem to provide useful paradigms here. (Indeed I believe it is useful to define mental health concepts in terms of a norm of rationality.) These are the sorts of things which cause a person to distort or refuse to recognize evidence, which warp judgment, or which render one's own motive structure inaccessable. I shall call an obstructive trait anything in a person's psychological makeup which prevents or inhibits possessed evaluative capacities from coming into operation in either thought or action or which causes such evaluative capacities to come into operation in a distorted fashion.

It is my opinion that the concepts of evaluative skills and attitudes and of obstructive traits are adequate for my purposes here to characterize the properties necessary for autonomy. Thus, a person who is possessed of a high degree of evaluative competencies and who is possessed of a high degree of mental health will be an autonomous person.

These two aspects of autonomy are conceptually distinct and can vary independently of each other. Clearly brilliant people can be neurotic and people of minimal intellect can be mentally healthy. The aspects of autonomy also interact. Sometimes a person's intellectual capacities can be used in the defense of his neurotic motives and beliefs. There is a story which illustrates this nicely. A certain woman went to a psychiatrist because she believed she was dead. The psychiatrist wishing to convince her that she was not dead asked her if dead people bleed, and when she answered that they did not he proceeded to draw blood by sticking her with a pin. The woman responded, "How about that; dead people do bleed." Considerable intellectual ingenuity may be utilized in rearranging one's opinions for the defense of a neurotic belief.

Commonly autonomy can be regarded as a function of a person's rational capacities and his mental health. A highly intelligent person is likely to find it more difficult to engage in self deception than a less intelligent person of comparable mental health. Likewise, a person of modest intellectual ability who is mentally healthy is likely to be more autonomous than a person of comparable intellect who is comparatively neurotic.

What is most interesting about both of these aspects of an autonomous person is that the properties which define them are acquired. People learn reasoning skills and attitudes toward rationality. They learn to be self-confident. While it is perhaps less accurate to say that

people learn to be neurotic or learn psychological obstructions, nevertheless, they do acquire such traits, and doubtlessly acquire them in part as a result of the kind of environment in which they find themselves. These observations raise the interesting question as to whether autonomy might not be taught or, to put the question more generally, as to whether we might not be able to identify the sorts of conditions under which autonomy develops and distinguish them from the conditions which retard its development.

There is, of course, a substantial literature, but no consensus, on the question of how people might be taught to think or evaluate and on the conditions under which neurotic or psychotic tendencies are acquired and gotten rid of. For the most part the suggestions which I shall make may be found within such literature and are also supported somewhat by "common wisdom." I shall not, however, attempt to argue extensively for my point of view. The reader should keep in mind that my purpose here is not to defend my own version of an education for autonomy, but to point out what happens to these hypotheses when viewed from the perspective of a behaviorist psychology.

We may begin by asking what sort of environment is conducive to the development of appropriate evaluative skills and attitudes. A start here may be made by quoting a rather famous passage from John Stuart Mill's essay "On Liberty."

> He who lets the world, or his own portion of it, choose his plan of life for him has no need of any other faculty than the ape-like one of imitation. He who chooses his plan for himself employs all his faculties. He must use observation to see, reasoning and judgment to foresee, activity to gather materials for decision, discrimination to decide, and when he has decided, firmness and self-control to hold to his deliberate decision. And these qualities he requires and exercises exactly in proportion as the part of his conduct which he determines according to his own judgment and feelings is a large one.[62]

We may subdivide the argument as follows. Mill can be read as claiming (1) that the development of a person's faculties, particularly those kinds of faculties which described in a better vocabulary would comprise part of what I have called evaluative skills, requires practice, and (2) that practice of skills of judgment and choice requires a degree of freedom. Pursuing these clues I shall

ask about what constitutes an adequate practice situation for the development of evaluative skills and about what sorts of freedom such a practice situation involves.

Bruner provides a second version of a thesis connecting practice with the development of intellectual skills.

> It is my hunch that it is only through the exercise of problem solving and the effort of discovery that one learns the working heuristic of discovery, and the more one has practice, the more likely is one to generalize what one has learned into a style of problem solving or inquiry that serves for any kind of task one may encounter--or almost any kind of task. I think the matter is self-evident, but what is unclear is what kinds of training and teaching produce the best effects.[63]

But why should practice be important to learning such skills. Perhaps the case can be made as follows. Since Ryle introduced it philosophers have made considerable use of a distinction between knowing that and knowing how. To know that is to know the truth of some proposition, p. To know how is to be able to do something. There are a number of interesting facts about the relation between these two kinds of knowing. Most interestingly, to know that some proposition p is true is rarely to know how to do something. This is generally true even when p describes the way in which something is to be done. Thus, for example to know several true propositions about how to swim and to know how to swim are two very different things. Likewise being able to formulate some grammatical rule and being able to employ the rule in speaking are two different things. These observations suggest two things. First, skills (knowing how) are rarely acquired merely as the result of verbal instruction. Second, a basic component in skill acquisition is practice. To resort to a standard educational cliche, skills are the sort of thing which are learned by doing. Since what we are interested in when we are attempting to create rational skills is not the ability to formulate various criteria of judgment, but the ability to employ these criteria, it is reasonable to suppose that these skills will be acquired by practice.

To suggest that rational skills are developed by practice is not, however, highly informative. We want to know what counts as practice or (as Bruner indicates) the conditions under which practice may be expected to be effective. Here it may be useful to distinguish practice from exercise. There are some kinds of abilities which are acquired merely as the result of repetition. If one

wishes to be able to do fifty push-ups he need do little else but engage frequently in the repetition of push-ups. That is exercise. But acquiring a skill depends not so much on generating muscle tissue as it does on bringing one's behavior into conformity with a standard of adequacy. Learning to perform a skill is learning to do something correctly. A standard of adequacy is merely a rule which specifies what counts as doing something correctly. If a person wishes to become a good golfer part of what he will try to do is to get his swing to conform to the standards for correct swinging which will be provided by any golf textbook or golf pro. If a person is trying to learn to think he is likewise trying to get his thinking, judgment, or reasoning to conform to standards which specify what counts as adequate inquiry. He will want his arguments to meet the standards for valid argumentation. He will want his evidence collection to conform to rational specifications. And he will want his hypotheses to meet initial standards of plausibility. In short, learning intellectual skills is a matter of internalizing and being able to apply acceptable standards.

This suggests that one ingredient in any effective practice situation must be some way in which the standards which define adequate performance become known to the learner. Three possibilities may be suggested. A standard of adequate performance may become known to a learner by (1) asserting it, (2) exhibiting it, or (3) through feedback. By asserting a standard of adequacy I mean formulating the standard as a rule and telling the learner what the rule is. By exhibiting the standard of adequacy I mean providing the learner a model of adequate performance--showing him how it is done. By feedback I mean providing information to the learner concerning how his performance compares to the relevant standards of adequate performance.

It is my opinion that an adequate environment for skill learning combines each of these three types, but the emphasis is to be given to feedback. Indeed, it seems to me that the basic question to be answered about a practice situation concerns the conditions under which feedback is informative and effective.

What this comes down to is a rather traditional doctrine to the effect that insofar as education is concerned to transmit intellectual skills, it must be conceived of as a process of inquiry. Put in general terms this means that education should be concerned with activities such as giving reasons, forming and testing hypotheses, collecting evidence, criticism and debate, and discovery learning. It should be more attentive to the process of inquiry than to merely transmitting the results.

Certain sorts of freedom follow from a commitment to treating education as a process of inquiry. First, the appropriateness of what might be called "intellectual

freedoms" is indicated. Intellectual freedoms are those designed to protect the free flow of information and provide for free and open criticism and debate. The function of intellectual freedoms is to circumscribe the use of authority in order to promote the dispassionate pursuit of truth. If we are to have successful inquiry, then opinion cannot be subjected to an authority other than the authority of evidence. This means that the expression of ideas or opinions and the circulation of information is not properly within the perview of an educational authority, and it means that the inquirer must have the privilege of following the evidence where it appears to him to lead and that it is inappropriate to subject the inquirer to sanctions for his views or for the direction which his inquiry takes. What I have called intellectual freedom is, of course, nothing more than the concept of academic freedom to which I have nothing more to add except that this sort of academic freedom is not merely a university ideology, but is appropriate to any educational institution insofar as that institution conceives of its inquiry as being among its purposes. Academic freedom itself, it should be added, is merely one instance of the general liberal doctrine concerning the virtues of tolerance of opinion.

A second type of freedom appropriate to an environment which encourages the growth of autonomy is the freedom of choice of the area of study. The virtues of this sort of freedom for promoting interest and motivation have been widely preached in educational literature, and undoubtedly there is much truth in the claim that free choice makes for a better motivated, more interested student. Free choice is also directly connected with the development of intellectual skills and, thus, autonomy. This point can be made in two ways. First, the most obvious context for the practice of the skills of judgment is the context of choice. As Mill notes, the use of one's faculties is brought into play chiefly when there is a choice to be made. Conversely a person who does not have choices to make, whose activity is planned out for him has very little opportunity to employ skills of judgment or evaluation, he has no need to think out what he should do, and thus, he has no opportunity to develop the skills on which the ability to make sensible independent choices depends and which lead to autonomy. This point may be summed up succinctly by the expression "Liberty promotes autonomy," which seems to me to be the central contribution of liberal political philosophers on the subject of the effect of free and open social institutions on the growth of the individual. An educational environment which promotes the development of an autonomous person will provide ample opportunity for the student to make his own choices.

Second, freedom of choice with respect to the topic of study is tied to the ideal of free inquiry. The study

of an area cannot be an inquiry unless the student sees the point of what he is studying - unless he has some grasp of the rationale for pursuing the inquiry. To inquire with respect to some question requires an appreciation of what a question means, of why it is posed in a certain way and not another, of what would count as an answer to the question, and of why the question deserves to be answered. These are intellectual questions which require an answer before an inquiry becomes possible. Thus, freedom of choice concerning what one will inquire about is part of the idea of following the argument where it leads. To prescribe the area of study is itself to inhibit inquiry.

Finally, an educational environment oriented toward inquiry is one which is free from indoctrination. Indoctrination may be loosely defined as a method of instruction which causes belief without providing evidence for that belief. Since the activity of inquiry is a matter of subjecting opinion to the judgment of evidence indoctrination is clearly excluded. We shall see soon that it is excluded on other grounds as well.

Very likely the same kind of free environment which is conducive to the development of evaluative skills will be conducive to the development of the appropriate accompanying attitudes. I have suggested that autonomy may well depend in part on the possession of affective traits such as self-confidence, confidence in one's judgment and a belief in a rational approach to the world. Confidence and self respect are often acquired as a result of success in endeavors of one's own choice. It is often the case that confidence in one's skill and ability develop as one's skills and ability develop. Moreover, when a person is given freedom this often indicates to him that he is respected and regarded as competent. Paternalism and the denial of the opportunity to regulate one's own life communicates conversely a lack of respect for the person and a distrust of his competence. Very likely such attitudes on the part of an educational authority have a way of becoming self fulfilling both because people often will internalize the attitudes others exhibit towards them and act on these internalized assumptions about themselves and because when an educational authority overly restricts a student's range of choice he denies the student the opportunity to develop the personal competencies on which autonomy depends.

Note also that to conduct education as a kind of inquiry may not only be expected to teach the skills of thought, but to affirm the value of a rational attitude toward the world. The treatment of a subject as an opportunity to think and the treatment of it as a body of established wisdom to be learned evince different values toward the subject. In the former case the underlying assumption

appears to be that judgments about the truth or falsity of ideas are to be made on the basis of available evidence. An emphasis on inquiry communicates the point that evidence is important. Likewise to treat subject matter as established fact to be acquired can easily communicate the value of the acceptance of authoritative opinion. In short, an emphasis on inquiry in education is more likely to transmit a belief in a rational attitude toward the world. Thus, again, insofar as certain kinds of freedom are presupposed by treating education as a process of inquiry, they are also part of the proper educational environment for teaching the requisite affective components of autonomy.

Since unhappily much of the literature on freedom in education sounds as though one is supposed to choose between freedom and authority or between freedom and control, it may be useful to indicate that no where have I suggested that a desirable educational environment provides anything like total freedom. The question of freedom in education is never profitably posed as simply an issue of whether or not we approve of freedom. Rather, profitable questions concern what sorts of freedom, to what ends, under what conditions. It is equally the case that certain kinds of authority and certain kinds of managemnt of the environment are required in an education for autonomy. Certainly, for example, my view does not preclude many kinds of educational planning. Inquiry requires not only the absence of controls on the free flow of information, but a richness of cognitive diet. Not surpressing this kind of input does not guarantee its availability. The availability of intellectual resources must be planned for. Further, a student does not profit autonmatically from being given a choice or engaging in an inquiry. The choice or inquiry must be something he can manage. This means that it must be appropriate to him given his age and present state of development. Inquiries and areas of choice must be bite sized and digestable, and this means that they must be planned and controlled with respect to their educational outcomes. Clearly the extent of this environmental planning will depend on the age and maturity of the child.

It should also be clear that nothing in my view precludes the maintenance of reasonable social order. It is useful to remember that while the enforcement of rules and regulations may seem on paper to restrict a student's freedom of choice, it may in reality be the instrument of liberating him from a more tyrannical peer group pressure (possibly the most serious kind of anti-intellectual authority operating in secondary schools) and of providing an environment where serious work is possible. Very often I believe that schools are neither too authoritarian, nor too permissive. Rather they are both, in that authority is applied to the wrong areas and not applied in the proper ones.

We have to this point focused on the intellectual components of autonomy attempting to note the kind of atmosphere which is plausibly thought to be conducive to developing intellectual skills and the affective traits necessary to support these skills. We need also to make some observations on the psychological aspects of autonomy.

Clearly people who have certain kinds of psychological deficiencies or who are neurotic or psychotic are restricted in their autonomy. Even if they have acquired appropriate evaluative skills, they may be psychologically incapacitated in bringing these skills to bear in certain circumstances.

Note initially that there is an area of overlap in the two basic categories. Affective traits such as self esteem or self confidence were grouped with evaluative skills because, like evaluative skills, they are desirable properties to be acquired rather than undesirable properties to avoid acquiring. Unlike evaluative skills, however, to lack self esteem or self confidence may be more than to lack a positive condition of autonomy, it may also be to possess a psychological condition which obstructs autonomy. A person who lacks self confidence will usually feel inferior. A person who lacks self esteem is very likely to be defensive. People who feel inferior or who are defensive frequently distort experience or twist judgment so as to serve the needs of an ego which needs constant protection from potentially depreciating experience. Thus to lack these kinds of positive aspects of autonomy is often to possess an obstructive trait. I am not clear on whether the relation between, for example, a lack of self confidence and feelings of inferiority is an empirical or a conceptual one. Nevertheless, these pairs of character traits and deficiencies seem closely bound together. Thus, it is appropriate to discuss concepts such as self confidence or self esteem and the consequences of their lack under the second classification as well.

It is clearly impossible to point to any consensus among psychologists concerning the psychological conditions of autonomy nor is this necessary for our purposes. Thus, here again I shall not claim that what follows is true, merely that it is plausible and that it is supported both by the analysis of autonomy which has been presented and by some research in clinical psychology. Let me begin with some assumptions.

1. Insofar as autonomy concerns the ability to make and act on rational judgments, the psychology of autonomy will be largely concerned to identify the psychological conditions which inhibit rational judgment or which frustrate its translation into action. The autonomous person is among other things one who does not do certain kinds of things. He does not distort experience; he does not warp judgment, and he does not engage in self delusion.

2. I shall group all of these undesirable psychological tendencies under the common label "defensiveness." The assumption which underlies this is that the primary reason for the distortion of experience by an individual is the unconscious desire to protect the ego from painful or depreciating experience or judgment and to provide instead acceptable experience or judgments. In short, when a person distorts experience or judgment he is engaging in ego defenses or is being defensive.

These comments suggest the connection of defensiveness with concepts such as self esteem. A person who has a reasonable degree of self esteem thereby has less of a need to be defensive. A person with a strong sense of self worth does not need to protect himself from unpleasant input nor to order his belief structure to suit a certain self concept. He can,therefore, face the world with some degree of objectivity. A person with a weak ego or who lacks self esteem, on the other hand, may be inclined to protect his fragile sense of self worth by editing or distorting threatening input.

If the above assumptions provide the rudiments of a plausible theory concerning the psychology of autonomy, then the question concerning the kind of environment which provides for the psychological conditions of autonomy may be appropriately subdivided into the following three questions.

1. What are the features of an environment which develops self esteem?
2. What are the features of an atmosphere which does not lead a person to become defensive?
3. What are the features of an atmosphere which if a person has failed to develop self esteem or has become defensive is properly therapeutic?

First, it should be emphasized that to some extent a person's sense of self worth is a result of his observation of what he is actually like. Persons may believe themselves to be competent, useful, or valuable in some fashion because they are competent, useful, or valuable in some fashion. As I have already indicated I believe that an education which is genuinely interested in creating persons who have a reasonable degree of self esteem and who are mentally healthy will do well to focus on creating the kinds of personal competencies which allow a sense of self esteeem to be based on an objective consideration of estimable qualities. Conversely, it will do well to avoid the mistake of treating self esteem as though it were the product of an environment which need have only appropriately ego supportive or therapeutic features. It is naive to think that a therapeutic atmosphere will be highly successful in creating a healthy sense of self respect in a person who possesses few of those qualities which are valued by some non-therapeutic community. In fact, I

suspect that it is not far fetched to suggest that an education which concentrates on being emotionally supportive to the exclusion of creating competencies may succeed in eroding the student's long term potential for self esteem.

Nevertheless, it is clear that there are subjective conditions which effect a person's degree of self esteem or his degree of defensiveness. That is, there are features of an environment which tend to enhance or detract from a person's self esteem and which do so independently of consideration of his actual abilities or other properties. An education which is concerned to promote autonomy will clearly want to exhibit these features. What are they?

Let me suggest two such features which comprise something of a package. An atmosphere which is inclined to develop self esteem, which will not develop defensiveness, and which will be therapeutic, will likely be one in which persons are seen and treated as having unconditional value and one which does not engage in ego attacks.

To suggest that persons are objects of unconditional worth is to suggest that there is value which attaches to human beings merely because they are human beings and which is independent of the kind or quality of human beings they are. Men are to be regarded as ends rather than means. They are to be considered as of intrinsic worth before they are treated as of instrumental worth. People may, on occasion, be valued on instrumental grounds. They serve the ends of other people, and for some contexts they should be responded to in an instrumental context. That is presumably how we proceed in deciding who to hire for a given job or in determining salary. People are often appropriately rewarded according to their instrumental worth. But people possess a value which goes beyond their instrumental worth. They are primarily ends and not means.

It is perhaps worth noting that while people may in fact develop a sense of self worth in terms of their instrumental worth (they may, for example, value themselves according to how well they perform their occupational role or according to the status which their occupational role possesses) it is not inappropriate for a sense of self worth to find its roots in a general concept of the value of human beings per se. If people could be persuaded to value themselves in terms of their intrinsic worth as human beings rather than in terms of their instrumental worth, that would have the merit of making self esteem a non-competitive object capable of achievement by every person.

It follows from the instrinsic worth of human beings that the ultimate worth of a person is never appropriately depreciated. It may be that a good educational environment will provide feedback on the quality of performance

and criticism where necessary, but it will also make clear that a person's worth is not an issue in his performance.

All of this in addition to being normatively sound strikes me as merely psychological common sense. If a person becomes less autonomous and more defensive when his sense of worth is threatened, it only makes sense that an environment conducive to autonomy will be one which accepts and acts on values which emphasize the unconditional worth of the person and reject acts which depreciate that worth. On the positive side, such an educational environment will exhibit love, unconditional positive regard, or respect for the student. (Since 'love' has acquired rather sentimental connotations lately and since 'unconditional positive regard' is associated with a particular school of clinical psychology I prefer the word respect.) Conversely, it should always be considered out of order to depreciate a person's sense of self worth. This suggests that racist or ethno-centric values or class distinctions are out of order in an environment which is conducive to autonomy. Clearly any sort of value scheme which is predicated on the notion that some kinds of people are inherently superior to others is a potential source of loss of self esteem to those on the bottom of the scale. It also suggests that a highly competitive educational environment, particularly one which uses a student's standing among his peers as a source of motivation, will exact a price of the student's autonomy.

Likewise these values indicate that ridicule or belittling are inappropriate methods of discipline in an environment intended to produce autonomous people. Obviously such methods of control have a high price in terms of a student's sense of worth.

Indoctrination is ruled out by the psychological as well as the intellectual requirements of autonomy. Inasfar as indoctrination attempts to create belief without providing evidence, it offends against the intellectual aspects of autonomy. But indoctrination often does more than fail to provide evidence for what the student is expected to believe, it often substitutes methods of instruction which render the student psychologically incapacitated with respect to holding a belief on rational grounds. A student who is merely told that p is true without being given any reason for believing it may not be especially enlightened about p, but neither is he especially damaged. A student who is told that to believe anything other than p is (e.g.) wicked or stupid or "out of it" may find that bringing p into question will be accompanied by feelings of guilt or self depreciation. Indoctrination, in short, not only generates unreflective belief but causes people to be defensive about their opinions. And clearly someone who cannot treat a certain

opinion as an object of assessment without suffering feelings of guilt or self depreciation has lost his autonomy with respect to that belief. In many ways so far as educational environment are concerned indoctrination is the chief offender against autonomy.

The features of an environment conducive to the maintenance of the psychological conditions of autonomy may also be described in a freedom vocabulary but in this case, it is a freedom-from vocabulary rather than a freedom-to vocabulary. That is, an environment conducive to psychological health is one that is free from things such as indoctrination, racism, and from anything else which causes a loss of self esteem. This kind of freedom-from may in fact liberate a person psychologically so that he becomes able to consider options and make choices that were previously closed not because they were forbidden by some external authority but because they were too psychologically threatening. It may thus provide the possibility of freedom of choice, but it does not provide freedom of choice in the sense that freedom of choice concerns what is permissible given the rules governing some institution. It appears to be the case that a consideration of the intellectual components of authority gives rise to views largely about the legitimate extent of authority whereas consideration of the psychological conditions gives rise to views which have more to do with legitimate means of authority. In both cases the opposite of authority is freedom, but in the former case it is freedom-to while in the latter case it is freedom-from. It follows that a consideration of the psychological conditions of autonomy is in fact compatible with educational views in which the extent of authority exercised is considerable. It is concerned largely with how that authority is exercised. Thus, again my argument for freedom in education should not be construed as an argument for anything which could be characterized as total freedom or permissiveness.

It is perhaps worth noting in this regard that while I have suggested that giving freedom of choice can be a sign of trust or respect and may, therefore, help to enhance self esteem, this is not necessarily the case. An absence of authority (particularly where children are concerned) may in fact indicate indifference and a lack of concern. To be an object of indifference is perhaps the most severe form of an ego depreciating environment. To be attacked is at least to be noted and to be assigned a certain import. To be ignored is to be treated as though one were nothing. Clearly many children prefer the former. It is important to keep in mind that to regulate a child's behavior justly by humanely enforcing reasonable rules is perhaps the clearest sign that the child is regarded as an object of respect and worth.

We may expand on this point by noting that the psychological conditions of autonomy do not require an absence

of criticism or feedback on a person's performance or behavior. They require rather that criticism be humane and that that adequacy of a student's performance on some tasks becomes divorced from considerations as to his worth as a person. While this is not altogether easy, it is not altogether impossible either. (The distinction may be easily captured in a teacher's vocabulary, for example, by the expedient of always using evaluative terms as adjectives for behaviors rather than for the persons who do them.) In any case, it is quite important that educators not be lead by a desire to provide a psychologically healthy environment to provide an environment which fails to provide the sort of feedback on which the growth of competence depends. On the view of autonomy developed here that is self defeating.

We may at this point summarize the conclusions about the nature of an environment which produces autonomy. The features of such an environment may be sorted into positive and negative types.

Positive Features:
- Opportunity to exercise choice
- Free exchange of ideas
- Freedom to inquire and the resources of inquiry
- Appeals to evidence
- Respect of persons

Negative Features:
- Lack of excessive management or authority
- Opinions are not subject to authority or sanctions
- Lack of a closed curriculum
- Lack of indoctrination
- Lack of ego attacks

B. Behaviorism: Some Conceptual Consequences

In this section I shall attempt to assess the conceptual impact of a consistently applied behaviorism on educational ideals and values and in the next shall also look at some blueprints for curriculum organization and instruction which have behaviorist associations in order to assess what influence behaviorism might actually have on educational practice.

In order to proceed it will be useful to have a paradigm of a behaviorist theory. For this purpose I shall use the theory usually called operant conditioning which I shall assume to be simply one way of stating Thorndike's Law of Effect.

The essence of the theory of operant conditioning can be expressed as follows: For any behavior, B, if B is reinforced by some reinforcer, R, under stimulus conditions, S, the probability of the truth "if S then B" is increased.

There are two difficulties of interpretation which should be raised. First, it may be argued that the Law of Effect and, of course, this instance of it, is circular.

The difficulty concerns the definition and identification of reinforcement. In early versions of the Law of Effect the word "satisfaction" is often found instead of reinforcement. "Satisfaction" has some advantages. While it is a rather unclear term in some respects, it seems nevertheless to refer to a commonplace part of experience. It is an easily understood term and since it seems to denote a kind of experience or feeling, it can be defined and identified in terms of its "felt" properties. But from a behaviorist perspective it also has an obvious difficulty. It appears to denote a mental state and seems to require an introspective report for its identification. The term reinforcement has neither of these problems, but it raises another for it is not at all clear how we are to decide when a person has in fact been reinforced.

This problem typically has been solved by defining reinforcement as some event which increases the probability of the recurrence of an instance of behavior under similar stimulus conditions. That has the merit of making the identification of a reinforcer possible on empirical grounds. If some R in fact increases the probability that B will reoccur under S then it is reinforcing. Otherwise it is not. The price of this move, however, is the circularity of the Law of Effect.

The reason is obvious, for the antecedent in the Law has been defined in terms of the occurrence of the consequent. If reinforcement is whatever increases the probability of behavior, then by substitution, the theory of operant conditioning asserts in essence that whatever increases the probability of behavior increases the probability of behavior. That is surely true, but not highly informative.

If the theory of operant conditioning can be read in this way, then it has a number of obvious practical and theoretical defects. It follows, for example, that the theory cannot generate predictions of behavior in the usual way that empirical laws generate predictions. That is, one cannot deduce the occurrence of some behavior from a knowledge of the theory and some set of initial conditions. One cannot do this because the identity of the initial conditions as reinforcing events cannot be decided independently of actually performing a test. Thus, for example, the theory cannot help us decide whether giving a pigeon corn for walking in circles will increase the probability of his walking in circles until we have actually tried to get the bird to walk in circles by giving it corn. We do not know if the corn is reinforcing until we see if it produces the desired effect. Having noted the results of the experiment we are then entitled to claim that giving a bird corn for walking in circles will increase the probability of his walking circles. That is, of course, a clear cut empirical claim and is not in the least

problematic. Its truth is, however, entirely independent of the theory of operant conditioning.

It also follows that the theory is an a priori truth and is susceptible of neither empirical confirmation nor of empirical refutation. Let us suppose, for example, that someone proposed to test the theory of operant conditioning by seeing if one can get a pigeon to walk a figure eight by reinforcing it with corn. The question we need to ask is "Will the failure of the experiment count against the Law of Effect?" The answer is clearly that it will not. If the bird fails to respond to the treatment in the proper way, given the way in which reinforcement is defined, the proper conclusion to be drawn is that corn is not reinforcing. In fact given the definition of reinforcement there is no conceivable state of affairs which could count against the Law of Effect. Further, it is a well received principle of testing that if a negative result on a test will not count as evidence against the theory being tested, then a positive result does not count as confirmation either. In short, the theory of operant conditioning is empirically vacuous. It does not assert anything about the conditions under which people learn and when rendered into common speech tends to amount to a recommendation to do what works without providing much help in deciding exactly what it is that works. That, it would appear, must be decided empirically on a case by case basis.

I believe that this objection is fatal to the view if one insists on treating this formulation of operant conditioning as an empirical law on a par with, for example, Boyle's Law or f=ma. There is, however, another way of understanding the theory which renders it respectible. One can treat the theory of operant conditioning as a kind of syntax for empirical statements within the behavioral sciences. On this view the thesis of operant conditioning is an assertion about what will count as an adequately formulated empirical law which proports to explain some range of human behavior. It is not, however, itself an empirical statement. Thus understood, operant conditioning amounts to a requirement that adequately formulated assertions must identify an event called a reinforcement, an event called a behavior, an event called the stimulus condition and must assert an empirically testable relationship between them concerning the effect of the reinforcer on the relationship between the stimulus conditions and the behavior.

Understood in this way and supplemented by statements concerning the techniques of identifying referents for the permissible terms, operant conditioning is a powerful intellectual tool for analyzing a behavioral situation and enabling the researcher to identify its relevant features and distinguish them from the irrelevant ones. A learning

situation after all contains innumerable aspects which can be conceptualized in a variety of ways. Operant conditioning specifies what aspects one ought to be interested in and how they are to be conceptualized. It helps the researcher identify the empirically interesting variables from among the blooming buzzing confusion. And in fact I believe that the success people have had who have employed operant conditioning with animals and with some sorts of human behavior testifies that it may be a very useful tool for getting at the relevant variables for some domains of behavior.

If operant conditioning is understood in this way, it also becomes capable of an indirect type of confirmation. If the Law of Effect is as I have argued true by definition, then there is no question of any empirical test of it since it is not an empirical assertion. If, however, its actual function is to identify relevant variables for empirical research or to provide a syntax for empirical statements, then questions arise about its actual utility or the range of its applicability. I take it that few people will deny that behaviorist views apply to some range of animal and human behavior. Rather what bothers many of us who are rather suspicious of behaviorism are the claims of the sufficiency of behaviorism to account for all types of human behavior. If we are to treat operant conditioning as a syntax for empirical statements, we may then put the question of the utility or the range of the view as one concerning the kinds of behavior which may be usefully investigated from this kind of conceptual framework or as one concerning the range of true propositions about human behavior which can be effectively expressed within the confines of behaviorist syntax.

It may well be that there are domains of human behavior which will not yield results when they are approached by means of the conceptual tools provided by operant conditioning, and it may well be that there are true empirical propositions which cannot be adequately stated within the confines of behaviorist syntax. For such areas operant conditioning will provide a set of conceptual blinders for the researcher who attempts to use the view to organize them. It will result either in the researcher ruling some kinds of empirical questions out of order in principle and in others never being posed. In other cases, it may result in the severe distortion of the phenomena of concern. This is, of course, the line of argument I have taken with respect to behaviorist views of thinking and which I shall take with respect to some concepts and ideas in education. That is, I have argued that behaviorist views on the nature of acceptable scientific assertions render behaviorisms incapable of adequately expressing the concept of a reason-explanation. I shall hold that as a consequence behaviorism is incapable of

expressing certain educational ideals and of formulating certain kinds of testable empirical statements about education. To approach education from a behaviorist point of view seems to me to accept a set of conceptual blinders which ensure that the behaviorist will miss some kinds of educational phenomena and will distort others.

A second difficulty in interpreting operant conditioning is understanding its relationship to rather commonplace and common sense explanations of behavior. Consider, for example, Skinner's introduction to a behaviorist analysis of economics where he notes, "...an individual is induced to perform labor through reinforcement with money or goods."[64] The similarity of this remark to the rather commonplace notion that people will work in order to obtain money is noteworthy. And the similarity of what follows in the chapter to commonplace knowledge of economics is equally striking. Indeed the obvious parallels between Skinner's explanations of a variety of social behavior and the usual teleological explanations provided by economists, sociologists, and political scientists suggest the question as to whether Skinner's explanations of human behavior provide any new facts about people or whether instead Skinner is merely insisting that we express some very well known facts in a behaviorist language.

Using the economic example as a paradigm we may put the question as follows.

Consider the following two sentences:

1. Jones works in order to get money.
2. Jones works because his working is reinforced by money.

Let us suppose that (2) is true and that (1) and (2) are explanations of the same act. Now if (2) is a true explanation of some act, does it follow that (1) is false? If the answer to this question is yes, then we have a right to ask the behaviorist for an account of exactly how they differ. For example, could we predict something from (2) that we could not have predicted equally as well from (1)? Is (2) part of a theory that can succeed in explaining facts which do not have obvious telelogical corollaries? Does using the language of (2) enable us to state the facts in a more precise fashion than is possible using the language of (1)? And, of course, once the behaviorist has given us a plausible account of how (1) and (2) differ we shall most of all want to know what the evidence is that (1) is false while (2) is true.

On the other hand, if the answer is that (1) and (2) are both true, then we may begin to ask if much of what behaviorists have had to say about the explanation of human behavior isn't simply vacuous in that it does not amount to the discovery of any new facts, but rather

merely comes down to the translation of common knowledge into a rather misleading vocabulary.

This suggests a strategy which may be used in assessing behaviorist claims about human beings. The behaviorist may be put on the horns of a dilemma in that it can be plausibly maintained that when behaviorist claims about human behavior are formulated with the precision that behaviorist claims about animal laboratory behavior usually are, they simply turn out to be false. They cannot generate reliable predictions of the facts. On the other hand, when they are formulated so as to not be obviously incompatible with the known facts they are vacuous in that they turn out merely to be translations into a special vocabulary (which has been suitably loosened for the occasion) of common knowledge.

There is a fair amount of evidence which can be pointed to to suggest the plausibility of this line of argument. The discussion of behaviorist accounts of thinking indicates that at the point where behaviorist accounts of thinking become reasonably adequate characterizations of the phenomena, they have largely abandoned central behaviorist tenets retaining largely only behaviorism's verbal form. Those accounts which maintain behaviorist claims in force are clearly false. Chomsky's review of Verbal Behavior is perhaps the classic exercise of this strategy where Chomsky shows that Skinner's attempt to apply behaviorist concepts to human language results in words such as stimulus, response, or reinforcement losing all distinctive content and in some cases merely becoming synonyms for the standard terms of cognitivist theories of language. The final chapters of Skinner's Science and Human Behavior are also highly suggestive of this line of argument. Those portions, dedicated to extending behaviorism to the "higher" sorts of behavior, seem in fact dedicated to an exercise in translation. Here one finds no new facts, no experiments, and no predictions of unexpected phenomena. Rather one discovers a variety of well known pieces of information expressed in behaviorist jargon. Indeed a great deal of what goes on in these chapters seems to be a matter of replacing the phrase "in order to" by the phrases like "under the control of" and "reinforced by." This kind of procedure surely makes the charge of vacuousness rather plausible.

This problem in understanding the relation of behaviorist claims to common sense views about behavior suggests both a difficulty in dealing with behaviorist views in education and a strategy. The difficulty is that if in fact behaviorists tend to maintain their plausibility by a retreat to a vacuous restatement of common sense, it then becomes difficult to know when looking at a "behaviorist" educational viewpoint or program whether one actually

has the real thing. That is, it is difficult to know whether behaviorist assumptions are actually being taken and applied seriously or whether instead what one has is a rather innocent piece of common sense described in behaviorist jargon.

This suggests (as does the first problem in interpretation) that the language in which behaviorist oriented educational programs are stated may turn out in the long run to be more interesting than what actually goes on in current programs. It may be that the interesting consequences of behaviorist influence on education will result more from the conceptual system used to describe practice than from current practice. If certain concepts are inexpressible in behaviorist language and if behaviorist concepts actually do function as a kind of syntax for research, we may expect that there will be consequences for what behaviorists perceive as worthwhile goals and for what they identify as interesting problems to research. It may be that some educational goals cannot be adequately stated in behaviorist language and it may be that behaviorist syntax frustrates the attention due to some interesting educational claims. In what follows I shall try to argue such a thesis. I believe that in fact in many cases where behaviorist ideas have generated or influenced educational practice, actual practice effectively emasculates behaviorist theory. On the other hand there is some reason to believe that behaviorist concepts have substantial potential to effect a marked long range ideological change in what we value in education and to effect a marked change in the kinds of possibilities for educational methods which get explored. Thus, in what follows I shall be primarily interested in seeing what behaviorist concepts may serve to talk us into or out of over the long term.

To a larger extent than is commonly realized educational ideals are tied to the concept of rationality. If, as I have argued at length, it is difficult or impossible to express an adequate concept of rationality or of reasoning within the confines of behaviorist language, then there should be repercussions for our understanding of educational goals and methods which are related to concepts of rationality. It is this thesis which I now wish to explore.

I shall begin by considering the distinction between what I shall call "persuasion" and what I shall call "indoctrination." I shall argue that this distinction cannot be adequately expressed in a behaviorist language and that when viewed from the perspective of a language system in which the distinction can be expressed, behaviorist methods of instruction when applied to the creation of belief, are accurately described as indoctrination.

Two things should be noted about this distinction initially. First, the distinction is typically employed to distinguish between cases when a person is active or free with respect to a change in his beliefs and those cases where he is passive or unfree. To say that a person has been indoctrinated is to say that something has been done to him. His beliefs have been changed, but he has not changed them. To say that he has been persuaded, on the other hand, is to suggest that he is active with respect to his beliefs. He has changed them. To indoctrinate is to change a person's beliefs. To persuade is to influence the person to change his beliefs.

Second, the distinction between persuasion and indoctrination is tied to concepts such as giving reasons or changing one's mind because of available evidence. To persuade someone is to give him reason's for changing his opinions about something. A person is persuaded when he changes his mind on the basis of available evidence. To indoctrinate is, in essence, to cause belief in some other fashion. A person has been indoctrinated when his mind has been changed without any reason.

The distinction between persuasion and indoctrination, thus, is dependent on a language in which the distinction between a kind of influence which results from the giving of reasons and other kinds of influence can be stated. Or, to put the matter in the standard vocabulary of this discussion, the distinction between persuasion and indoctrination is an application of the broader distinction between a reason-explanation and a mechanistic explanation. When a person has been persuaded, it follows that there is a true reason-explanation for his change of belief. When he has been indoctrinated, it follows that there is a true mechanistic explanation of his change of belief. Therefore, insofar as a behaviorist language is unable to employ those kinds of logical concepts necessary to formulate the concept of a reason-explanation, it will also be unable to make sense of the concept of persuasion and will be unable to formulate the distinction between persuasion and indoctrination.

This point can be made clearer by formulating a concept of persuasion and checking to see if it can be formulated within the confines of the language of operant conditioning. Let me suggest the following as an analysis of the concept "having been persuaded." I shall say that X has been persuaded that p by Y iff

1. Y gives evidence, E, that p to X
2. X infers that p from E
3. Inferring p from E causes X to believe that p.

(1) indicates that it is a necessary condition of "being persuaded by" that one receives some evidence. (2) indicates that if one is actually persuaded, it is necessary

to respond to the evidence as evidence. (For example, if a teacher provides a student evidence, E, that p is the case, but the student comes to believe that p because he is impressed with the authoritative tone in the teacher's voice while he presents E, then the student has not been persuaded although the teacher may, in fact, be trying to persuade him. (3) suggests that in order to be accurately described as having been persuaded, it is necessary not only to respond to E as evidence but, also, that inferring p from E must be the cause of X believing p. This analysis is, I believe, a reasonably adequate characterization of the concept of persuasion in that sense of persuasion which is properly opposed to indoctrination. (Its main weakness is that it makes special pleading, lying, or other acts which involve providing evidence in a misleading fashion cases of persuasion. One might plausibly hold that they are more appropriately classified as indoctrination.) We may conveniently understand "X is indoctrinated that p by Y "as any way in which X brings about the belief that p in Y which is not a case of persuasion.

Could such a distinction be formulated using the vocabulary of operant conditioning? The difficulty which operant conditioning must overcome in order to express the distinction is that it seems to have only a single "influence" concept; namely, reinforcement. That is, the language of operant conditioning seems to have a poverty of causal types--types of things which cause behavior. Reinforcement is what there is that causes behavior. To be sure, reinforcement comes in two kinds, positive and negative. And there are a vast collection of conceptual devices (such as reinforcement schedules) which lend sophistication and refinement to the employment of the concept. Nevertheless, it is hard to see how one might go about expressing the distinction between persuasion and indoctrination in a reinforcement language.

First, consider that the distinction between positive and negative reinforcement does not correspond to that between persuasion and indoctrination. The distinction between positive and negative reinforcement concerns essentially the aversiveness or (if the reader will pardon a mentalist rendition of positive reinforcement) the pleasurableness of the stimuli. It should be obvious enough that whether or not a stimulus is aversive or pleasurable has little to do with whether or not it can be taken as evidence for what one believes.

Very likely, if the distinction between persuasion and indoctrination is to be expressed in a language where the sole influence concept is reinforcement, it will be done by using logical concepts in order to characterize reinforcers or to characterize the conditions under which reinforcement is given. Skinner suggests something like this in the closing pages of Verbal Behavior when he

claims that in writing the book he attempted to "conform to the special reinforcing contingencies of the scientific community..."[65] This could be unpacked in two ways. On one hand, it could mean something to the effect that scientists find claims that are defended with cogent arguments and persuasive evidence to be positively reinforcing. On the more likely reading, it could mean that the scientific community makes reinforcement contingent on a scientist's exhibiting behavior which satisfied appropriate logical criteria for the validity of arguments or the persuasiveness of evidence.

If a behaviorist is willing to employ such concepts to characterize either the reinforcement itself or the circumstances under which reinforcement is provided, then he will have made a start in formulating a concept of believing for evidence. At least, insofar as the features of the environment which effect the person's belief or behavior are characterized in the kind of logical vocabulary normally employed to talk about evidence, and insofar as the person in question is in fact responding to, or because of these logically characterized features, I am willing to describe him as responding to evidence or as being persuaded. And having, thus, formed a concept of persuasion, there is no problem in forming a concept of indoctrination as its opposite.

But, of course, in trying to formulate the distinction in this way, we have merely reopened the questions of Section IIB of this document. There it was argued that it was unlikely that a behaviorist psychology could succeed in incorporating logically characterized concepts into its conceptual repertoire without abandoning the central tenets of behaviorism. This conclusion applies equally well here. The concepts necessary to formulate the distinction between persuasion and indoctrination are available to the behaviorist at the price of the vacuousness of his viewpoint. I suspect that Skinner's comment on his procedure in writing Verbal Behavior illustrates this nicely. It appears that what the remark comes to is that Skinner believes that he has adhered to acceptable canons of scientific reasoning in developing his argument and presenting the evidence for his case. If that is in fact what Skinner's comment means, then one is entitled to ask what is gained by putting the claim into a behaviorist vocabulary, and the answer to this is not at all obvious unless one is willing to make a virtue of obscurity.

We are then entitled to conclude that it is unlikely that a rigorously applied behaviorism will be able to formulate the distinction between persuading and indoctrinating, and it follows from this that a person who approaches education from a behaviorist point of view will come with a self-imposed pair of conceptual blinders so far as an important set of issues in the ethics of

instruction is concerned. If behaviorists occasionally appear insensitive to the ethical issues raised concerning the control that education may exercise over a student's life, this may well provide part of the explanation.

It does not, of course, follow from the fact that behaviorist language is not up to formulating the distinction between persuasion and indoctrination that behaviorism will involve substantial amounts of indoctrination. Nevertheless, it can be easily argued that that is in fact the case. To see this one need only ask what would be involved in applying the theory of operant conditioning to issues of belief (or, if one prefers behavioral variables, to verbal behavior expressing belief). In such cases, the claim that appropriate verbal behavior will be given positive reinforcement seems to be merely a euphemism for the claim that a person is to be rewarded for believing what it is desired that he should believe or for doing what it is desired that he should do. And, of course, to obtain agreement by offering rewards or punishments for it rather than evidence is virtually paradigmatic of what is meant by indoctrination. The idea of obtaining agreement by inducements is perhaps not overly offensive when it is applied to teaching elementary skills such as reading or basic arithmetic. It becomes more offensive as the students become older and the subject matter being taught becomes more controversial, or when we become more concerned with whether a person has reasons for what he believes. The application of the view to a graduate seminar is, then, highly objectionable. Try imagining the idea of rewarding a graduate student with praise or perhaps money for exhibiting the "proper" verbal behavior, and it becomes clear that something has gone wrong.

Here too, the problem can be evaded by holding, for example, that what we reinforce in a graduate seminar is not mere agreement with accepted opinion, but well informed opinion or well-argued ideas. Perhaps, the teachers' positive reinforcement will be given, not to correct answers, but to coherent arguments and well-defended positions. Well, insofar as the behaviorist in fact does this, my objection loses most of its force. But then we must also note that the behaviorist who makes such a response has taken that first step down the garden path to vacuity. For to attempt to reserve reinforcement for valid arguments clearly requires that we characterize the students' behavior by means of a logical vocabulary. We shall have to describe what the student does in terms of whether his behavior conforms to appropriate logical rules. By now the response to this move should be obvious. To attempt to incorporate a logical vocabulary into a behaviorist framework leads to an abandonment of basic behaviorist doctrines. If this is the case, then we may

conclude that a rigorously applied or non-vacuous behaviorism will conceive of the "cognitive aspects" of education as largely the reinforcement of the correct answer to predetermined questions, and that this will be understood in a way which is correctly described as indoctrination. It will amount to the inculcation of belief in illicit, i.e., non-rational, ways.

It is most important to notice that the inability to adequately formulate the distinction between persuading and indoctrinating is merely one indication of a rather general difficulty that behaviorism suggests for education. The general difficulty is that a non-vacuous behaviorism cannot formulate an adequate concept of reasoning or believing something for evidence; and, thus, it comes to education with a built-in bias against views of education in which the concept of rationality is central.

The consequence is that a rigorously applied behaviorism is committed, in virtue of its difficulties with the concept of reasoning, to thinking of education as having nothing to do with inquiry or with the acquisition of rational skills. The following three examples should suffice to make this point.

First, it is very difficult from a behaviorist point of view to treat reason giving as a part of good pedagogy. Reason giving is a way of creating or changing belief which proceeds by providing evidence for the truth or falsity of the belief. As a part of pedagogy, it has much to commend it. It is a form of persuasion rather than indoctrination. I have argued earlier that reason giving is also part of a pedagogy which is oriented toward creating the intellectual skills which are part of autonomy. It can even be suggested that reason giving has merits for the long range retention of information. Insofar as understanding an idea facilitates remembering it, and insofar as knowing the reasons for believing an idea is part of what is meant by understanding it, it is plausible to suggest that reason giving will facilitate retention.

But it should be clear that the same sort of logical concepts necessary for describing thinking will be necessary for characterizing any piece of behavior as an act of reason giving. It follows that a consistent behaviorist view of pedagogy will have no place for the activity of reason giving. Behaviorism will be highly corosive of any educational ideology which places any value on the idea that people should have reasons for what they believe and which has a view of teaching which corresponds to such a goal. It would appear that from a behaviorist point of view, reason giving will be replaced by the rewarding of the correct response to appropriate stimuli. In effect, concern for a rationally held set of beliefs is replaced by a concern for retention of information.

Much the same thing can be argued for much the same reasons concerning discovery learning. Let me assume for the sake of argument that the center of the concept of discovery is the concept of verification. To discover is to find out for ones self, and paradigmatically what we mean by finding out for ones self has more to do with experimenting, reasoning, or getting evidence than it does with looking something up in a book. To discover is to find out that something is true by getting the evidence for ones self. Thus, while discovery may be more than verification, verification is the center of the concept.

Verification is a kind of reasoning. It is the kind of activity which involves the use of appropriate logical rules to decide whether or not conclusions follow from premises or are warranted by available evidence. It follows that verification and also discovery will be the kinds of activities which will require for their characterization a logical vocabulary, and it follows that the inability of a behaviorist language to adequately express the kinds of logical concepts necessary for such a characterization will result in the inability of a behaviorist language to express an adequate concept of discovery learning or discovery teaching. Thus, here, as in the previous case, it appears that a rigorously applied behaviorism has the potential to expel any concern for getting or presenting evidence from the goals or teaching methods of education.

A third example is suggested by the recent emphasis of curriculum and instruction on what has been called the structure of knowledge. Let me begin by quoting some remarks by Jerome Bruner concerning his interpretation of what it means to emphasize the structural features of knowledge.

> You may by now have recognized the parallel between what I am suggesting and what we have come to know about language comprehension and production, and their acquisition. Learning to be skillful with a body of knowledge is much like learning a language, its rules for forming and transforming sentences, its vocabulary, its semantic markers, etc. As with language, there is also the interesting feature in all such learning that what is learned is initially 'outside' the learner--as a discipline of learning, as a subject matter, as a notational system.[66]

On the same page Bruner notes the incompatibility of this view with prevailing behaviorist views.

> In none of what we have described thus far is there anything like memorization or performing a particular repertory. Conventional learning theories have little to do with the matter and it seems inconceivable that there stands between you and understanding a missing word of praise or a chocolate bar. Rather, what seems to be at work in a good problem-solving 'performance' is some underlying competence in using the operations of physics or whatever, and the performance that emerges from this competence may never be the same on any two occasions. What is learned is competence, not particular performances.[67]

Bruner's comments can be explicated and related to the general discussion as follows: According to Bruner, the emphasis in education ought to be on teaching generative ideas, that is, ideas, concepts, or strategies which generalize so as to "generate" a proper response to a novel case in the way in which rules of grammar are generative in enabling us to formulate or understand novel sentences. A concern with this "structure" of knowledge in Bruner's view is the key not only to a greater degree of comprehension of knowledge systems, but the ability to use such systems in new ways or to transfer knowledge to new situations. The virtues of the emphasis on the structure of knowledge are greater understanding and transfer.

This theme is developed by means of an analogy with language. Just as it is a knowledge of grammar of a language which accounts for the ability of a native speaker to generate new sentences at will, it is a grasp of the "grammar of knowledge" which enables a skilled person to generate new uses and new instances of that knowledge, and it is here that Bruner seems to feel that his views come into conflict with behaviorist views of learning. To have grasped a piece of the structure of some body of knowledge is to have developed a competency, a generalized skill in employing the "grammar" of knowledge in a variety of situations. Behaviorism, Bruner suggests, replaces competence with performance, indeed, particular performances. Bruner's point seems to be that behaviorism cannot deal with the grammar of knowledge and the consequence is that generalized skills described in terms of this grammar disappear in favor of particularized performances. The learner is placed in a position analogous to that of a language learner who instead of learning the rules which govern a language, is required to learn the language as a set of particular responses to particular situations.

Bruner's argument on this reading is in essence merely an extension of the kind of position I have attempted to develop concerning the inability of a behaviorist language to express logical concepts. In effect, Brunner has noted that the thesis that the logical concepts necessary to characterize human reasoning cannot be expressed in a behaviorist language is easily extended to apply to any kind of grammatical rule. Bruner's claim then seems to be that behaviorism cannot adequately express concepts which are constructed out of grammatical rules. Since the learning goals of the structure of knowledge approach to curriculum and instruction are understood in such terms, it should be expected that a behaviorist psychology will have difficulty with such goals. Behaviorism has difficulty with generative concepts for such concepts appear to be inexpressible as S-R relationships.

All of these examples point to a similar conclusion. If consistently applied to education, behaviorist principles will lead away from a view of education which conceives of education as a matter dealing with knowledge or ideas as objects of assessment. The values of believing for reasons, of inquiry, of the dispassionate pursuit of truth, and of concern for evidence are incomprehensible from a behaviorist point of view. Likewise, educational means such as the presentation of evidence, discovery learning, or concern to provide for criticism and debate seem out of place from a behaviorist's perspective. On the other hand, a bias is exerted toward an excessive concern with the acquisition of rote skills and with information retention, that is, with those kinds of objectives which can be easily described in a behavioral language without benefit of logical or grammatical concepts and which are readily thought of as appropriately taught by means of a system of rewards.

I have argued that certain views about freedom in education are tied to the view that education is largely concerned with matters such as evidence and inquiry. What I shall attempt to argue now is that behaviorism's inability to understand the intellectual concerns of education also render it incapable of providing a coherent view of freedom or legitimate authority in education.

Let me begin here by formulating an argument which summarizes a line of thought expressed in Skinner's Beyond Freedom and Dignity, concerning the subject of the appropriate extent of control. According to Skinner:

1. "Libertarians" have objected to control of behavior in order to protect autonomy. In doing so, they assume that there is a choice to be made between controlled behavior and free behavior.

2. In fact, since everything a person does is under some kind of control, there are no such options. What the "libertarians" options actually amount to is a choice between planned control and accidental control.

3. Thus, while it may be legitimate to resist control when it is being used aversively, to object to control in principle merely because it is supposed to be incompatible with autonomy has the consequence only of substituting accidental control for planned control and, thus, results in denying us of the benefits of behavioral engineering.[68]

Two assumptions of this argument ought to be noted. First, while Skinner does not identify any individuals as "libertarians" (except that he quotes from John Stuart Mill occasionally in ways which intimate that he believes Mill to have been one), it seems clear from his examples that his objections are intended to apply at least in part to the liberal tradition in political philosophy, particularly to those aspects of liberalism which emphasize individual rights and liberties. What is interesting about this is that Skinner apparently assumes that liberal ideals, insofar as they are not directed at "eliminating aversive stimuli," are intended to protect a person's autonomy.

Second, the protection of autonomy is in turn understood as a matter of maintaining a sphere of uncaused behavior. Skinner at one point ascribed the following argument to libertarians: "Control is clearly the opposite of freedom and if freedom is good, control must be bad." And thus concludes that in order for libertarians to defend autonomy it is necessary "to maintain the position that all control is wrong."[69] (It will be instructive for the reader to ask himself if he knows of any serious thinker who ever held such a position. I don't. In fact, even many anarchists object in principle to governmental control basically because they feel that the control exerted by other social groups is preferable. Surely, while many people have held that coercion is at best a necessary evil, no major figure in the English or American liberal tradition ever held that control is objectionable in principle.)

Let us examine Skinner's argument. Initially it should be noted that Skinner's understanding of what he calls "the literature of freedom and dignity" is wrong or misleading in the following respect: Insofar as the literature of freedom and dignity is supposed to include the political writings of classical liberalism, it is mistaken to believe that the defense of liberty is primarily for the sake of autonomy. Mill, for example, in the opening lines of "On Liberty" explicitly distinguishes the problem of freedom and determinism from the problem of liberty.

> The subject of this essay is not the so-called 'liberty of the will,' so unfortunately opposed to the misnamed doctrine of philosophical necessity; but civil, or social liberty the nature and limits of the power which can be legitimately exercised by society over the individual.[70]

While, as I have noted, Mill did claim that liberty has certain merits concerning the development of the capacity for independent judgment, a capacity which is part of autonomy and which is part of what is at issue in traditional disputes concerning freedom of the will, such considerations are not at the center of his argument; and clearly Mill's major thesis is developed in a way such that questions concerning whether or not men are free or determined are largely irrelevant to it. (Mill was himself a determinist!) It may be useful to consider Mill's own summary of his arguments for freedom of thought and expression.

> First, if any opinion is compelled to silence, that opinion may, for aught we can certainly know, be true. To deny this is to assume our own infallibility.
>
> Secondly, though the silenced opinion be an error, it may, and very commonly does, contain a portion of truth; and since the general or prevailing opinion on any subject is rarely or never the whole truth, it is only by the collision of adverse opinions that the remainder of the truth has any chance of being supplied.
>
> Thirdly, even if the received opinion be not only true, but the whole truth; unless it is suffered to be, and actually is, vigorously and earnestly contested, it will, by most of those who receive it, be held in the manner of a prejudice, with little comprehension or feeling of its rational grounds. And not only this, but, fourthly, the meaning of the doctrine itself will be in danger of being lost or enfeebled, and deprived of its vital effect on the character and conduct: the dogma becoming a mere formal profession, inefficacious for good, but cumbering the ground and preventing the growth of any real and heartfelt conviction from reason or personal experience.[71]

Mill's overall strategy in the essay "On Liberty" is to generate what he calls a defense of liberty by means of an appeal to the principle of utility which is usually expressed as the greatest good for the greatest number. In short, Mill is attempting to show that liberty is a social good. Liberty is conceived of by Mill, not as total lack of social control over the individual, but as lack of social control in certain areas which Mill calls freedom of thought and discussion and individuality. Mill is perfectly willing to grant the appropriateness of social authority over behavior which has consequences for the well being of others.

The argument concerning freedom of thought and discussion is intended to show that beneficial consequences ensue from the toleration of diversity of thought and expression. Mill's strategy is to assume that truth is of some social utility and to argue that liberty promotes the pursuit of truth. His argument comes to this. A social situation which permits criticism, debate, diversity of opinion, and the free flow of information is more likely to facilitate the pursuit of truth than a social situation which does not permit these things. Mill generally concludes that liberty is a social good meaning that the supression of criticism, debate, etc. has certain harmful consequences.

For our purposes, two things are important about this argument. First, it is overwhelmingly clear that this defense of liberty has nothing to do with autonomy. Standard arguments for "intellectual liberties" such as freedom of speech or freedom of the press have as their goal a social good, not free will. Second, Mill's claim while not formulated in precise quantitative terms is clearly an empirical claim. It is a claim about the consequences of certain uses or misuses of authority in a society on the intellectual life of that society. It can be summarized readily as the claim that open social institutions promote a higher quality of intellectual life than closed ones. There is no inherent difficulty in formulating reasonable operational definitions of either openness or of the quality of intellectual life. Thus, the claim is in principle expressable in testable empirical fashion. (No one pretends that it would be particularly easy.)

What follows is that so far as traditional liberalism is concerned, both the assumption that objections to control are motivated by a desire to protect autonomy and the assumption that arguments against control are somehow inherently anti-scientific in that they are intended to protect an area of uncaused behavior are red herrings. In fact, Mill's claim (which is generally recognized as the classical statement of the position) is a testable empirical claim having little to do with individual autonomy.

One can then only be mystified at Skinner's arguments. If people such as Mill are not actually the objects of Skinner's objections, then we are entitled to ask who (or what) is Skinner talking about. But if Skinner does intend his objections to apply to typical liberal positions (as he obviously does), then we are entitled to ask how (short of the obviously inexcusable unfamiliarity with the views) he came to so distort the views he is discussing.

There is, I suspect, a systematic answer to be found to this question in the concepts of Skinner's theory of operant conditioning. One need merely observe that Mill's views of the legitimate extent of authority are tied to his opinion that people reason in order to understand why Skinner should have trouble seeing their point. Mill, after all, is noting that criticism and debate facilitate the process of the consideration and evaluation of ideas. However, if one's views on what influences learning are that positive and negative reinforcement and not much else are what influence learning, then as I have argued repeatedly, it is difficult to formulate the view that people think or reason. This being the case, it is also difficult to see the point of a view of legitimate authority intended to maintain an environment which facilitates the activity of reasoning. If reasoning is incomprehensible, then the point of criticism and debate becomes equally incomprehensible. Thus, given a behaviorist point of view, the point of the intellectual civil liberties is rather hard to see.

This argument may be rephrased in the following manner: It is difficult to see how a claim such as "Criticism is conducive to the pursuit of truth" can be effectively rendered in a behaviorist language. Criticism and debate are (at least in their more meritorious instances) forms of reason giving. To criticize someone's ideas is to provide evidence that those ideas are false as well as to suggest some of the evidence which will have to be taken into account by a more adequate view. But we have already seen that a behaviorist language will have substantial difficulty in adequately expressing the concept of reason giving. It follows again that one cannot make sense of the activities of criticism or debate from a behaviorist point of view, nor can a behaviorist be expected to understand a view of legitimate authority designed to protect such activities.

Thus, it is not really surprising that Skinner should assume that the point of libertarian views is either to reduce aversive stimuli or to protect autonomy, for he is blinded to the real point of such civil liberties by the expressive limitations of his conceptual framework. The exegetical perversions of his work are deep in the roots of his conceptual system.

If my argument here is correct, then clearly a major problem of Skinner's argument is that he presents the question of legitimate authority as largely a simple choice between controlling people or not controlling them. But, of course, the basic question of legitimate authority is not whether or not people should be controlled, but, as Mill's argument adequately illustrates, concerns what acts are and what acts are not legitimately controlled. In reading Skinner's argument, one can easily come to feel as though he were being asked to decide whether or not he approved of drugs without being permitted to distinguish between aspirin and heroin. Issues of legitimate authority are not adequately conceptualized as a simple choice between controlling or not controlling.

The center of this difficulty, I suspect, concerns Skinner's use of the concept of control. Specifically, Skinner rather uncritically assumes that a use of the concept of control which clearly has its roots in science can be effectively employed to discuss problems of ethics and social philosophy. In what follows, I shall argue that this is clearly mistaken.

Skinner's concept of control seems to be tied to the notion of a scientific law. Thus, 'X controls Y' appears to mean that there is some true law in which X is antecedent and Y is consequent such that 'if X then Y' is true. 'Control' given this sense comes to be employed as a general influence term. That is, to say that X controls Y is to say little more than that the occurrence of X has an effect on the occurrence of Y.

This use of the word control easily leads Skinner to assume that anyone who objects to the control of human behavior must, therefore, be advocating the peculiar notion that men ought to relate to each other so as not to affect each other's behavior. This in turn leads him to object to such views with a general advocacy of control.

If what Skinner is really saying is that an ethical position which makes a general duty of not influencing another person's behavior is objectionable, I can only agree (I'm not at all sure who would disagree) but hasten to add that nothing at all follows about the standard views on the merits of liberty. If Skinner thinks otherwise, it may be because he has imported the scientific sense of control into problems of ethics.

But this is a mistake. Recall again the illustration in Section I concerning differing causal histories leading up to the buying of a car. Mr. Jones buys his car because he is threatened with a loss of job if he does not. Mr. Smith is psychologically manipulated into buying a car. Mr. Black, however, buys his car as the result of an assessment of his needs and the information provided by a consumer publication. Mr. Jones is coerced, Mr. Smith is manipulated, and Mr. Black is persuaded. There is no

difficulty here in holding that Smith and Jones are under some kind of control, and it is also clear that they are not free. However, it is odd to describe Black as controlled in a normative sense of that term. It would, of course, be freely admitted that Black's behavior was influenced by the consumer publication, but as argued, it would be peculiar to infer from that that Black was not free in his choice of cars.

What follows is that the importation of the scientific use of 'control' where 'control' means simply 'to have an effect on' into a consideration of questions concerning the legitimacy of controlling the behavior of other human beings where the word 'control' tends to be used to indicate that the controlled person is not free is at best to uncritically assume that all views of freedom and liberty are somehow expressions of an antideterminist and antiscientific view about human behavior. I have argued at length in the first section that this is not true even of autonomy, but it is clearly not the case with respect to standard views concerning civil liberties. Once this is recognized, it follows that issues about freedom cannot be conceptualized as issues about the merits of control in the scientific sense of that term. To do so is to impose on a variety of issues about freedom a conceptual framework totally inadequate to even posing the proper questions and which assumes without a shread of evidence that one way of influencing behavior is qualitatively the same as any other and is to be judged solely from the perspective of efficiency in producing the intended behavioral outcome with no consideration of the violation of the subjects' rights. I find it hard to conceive of a worse conceptual disaster.

The argument concerning the relation of behaviorism to the intellectual liberties can be summarized as follows:

1. The intellectual liberties can be defended without an appeal to the goal of autonomy and can be stated as empirical facts about the effects of the environment on behavior.

2. Behaviorist views tend to miss this because of an inability of the conceptual framework of behaviorism to formulate the concepts on which an adequate view of legitimate authority depends.

These conclusions indicate, therefore, (1) that the behaviorists' arguments against liberty are irrelevant given actual liberal arguments and (2) that the real clash between behaviorism and libertarian views lies not in that libertarians accept an anti-scientific view of man, but that behaviorists accept a conceptual framework which is too rigid and impoverished to formulate libertarian ideals.

These conclusions are, of course, readily stated as conclusions about educational institutions. (In a sense, they are already stated as conclusions about education.

A dominate concern of liberal political philosophers has always been the educative effects of social and political institutions.) One merely need note that the values that Mill's position is intended to facilitate are educational values to see why. Mill's arguments are intended to protect the life of the mind from the encroachment of the civil authorities. If we are to hold reasoned and reasonable opinions, then these opinions will have to be subjected to criticism, evaluation, and will have to be tested against competing views; and if we are to have an atmosphere in which such activities take place, we will have to protect them against the exercise of authority. This and similar arguments are not only the basis of objections to governmental censorship, but are the essence of the educational doctrine of academic freedom. Undoubtedly, such doctrines will need to be modified if they are to be cogently applied to young children. Nevertheless, insofar as the "life of the mind" is considered to be an appropriate part of the life of an educational institution, the intellectual civil liberties are an appropriate part of the view of legitimate authority of educational institutions. And the same arguments which indicate that a behaviorist point of view renders such ideals unintelligible generally will show that behaviorism will render these ideals unintelligible for educational institutions.

While one need not appeal to autonomy in order to defend liberty, nevertheless such an argument is defensible. Earlier in this section I argued the general notion that liberty promotes autonomy. I wish now to suggest that this position can be defended against Skinner's argument. The general thesis was developed as the claim that the opportunity to choose is a necessary condition of the development of the capacity for independent choice or of autonomy. It was argued in the process that such a view was not incompatible with educational planning or management but that it required a particular conception of planning--one that provided appropriately circumscribed areas of choice--and was antithetical to an excess of management.

The first thing that should be pointed out about this position is that not only is it not based on any anti-scientific view about human behavior, but is in fact a testable empirical claim. I have, of course, argued at length that the concept of autonomy can be adequately explicated within a determinist framework. Here it needs to be added that while undoubtedly the formulation of a rigorously testable version of the thesis that liberty promotes autonomy is a formidible task, there is no reason to believe that it is in principle impossible. One need only provide adequate operational definitions of liberty or of open social institutions and an adequate operational

definition of autonomy to put the assertion in the kind of shape where one can begin to decide on some kind of design whereby a correlation might be identified. Openness can be defined in terms of the frequency and quality of choice points provided by a social situation or by a school and/or by the kinds of activity against which there are or are not sanctions. Autonomy will likely be harder. Here one will be looking for empirical indicators of the ability to respond to the world as evidence. This will require among other things being able to recognize the ability of a person to make sensible judgments as well as the ability to gauge a person's defensiveness. That this is a difficult undertaking is clear. But that it is possible should be certified by among other things that with some degree of success we make such judgments all the time.

Perhaps some sense of the empirical meaning of the claim can be gotten by means of an example. The point of 'liberty promotes autonomy' can be most clearly seen in considering the institution of slavery and its effect on the master as opposed to the slave. Consider the stereotype of the slave who is cowed, subservient, incompetent, unable to decide for himself, lacks initiative, requires having his affairs managed by others, and is generally capable of little more than executing the commands of others. By contrast the stereotyped master is confident, competent, self-assured, decisive, capable of taking initiative, and generally capable of managing his own and other's affairs.

Clearly these characterizations are stereotypes, but there is ample evidence that they have some basis in reality. Actual exemplifications of the institution of slavery in fact produce people who tend to exhibit these properties. It is, of course, precisely these personality characteristics which have been used to justify slavery from Aristotle to the pre-Civil War South. However, there is no longer any doubt that such personality features are largely effects of the institution of slavery, not its precondition or justification. The social roles of master and slave have differing educational consequences, and this difference is interestingly close to the difference between an autonomous and non-autonomous person.

The most obvious difference in the environments of the master and the slave is the difference in the respective liberty available to each group. The master has a wide range of choices available to him and a high degree of control over his own life. The slave has a rather small range of choices available and little control over his day to day activity. Mill's account of the consequences of authority and liberty on growth provides a very plausible account of the connection between this difference in available liberty and the development of

autonomy. The development of the capacities on which autonomous choice depends requires practice, and practice of autonomous choice requires the opportunity to choose, which requires liberty. Thus, liberty promotes autonomy.

This example suggests not only the empirical meaning of the claim that liberty promotes autonomy, but (I believe) that the claim is quite likely true. Again, however, the point of interest here is that the claim is in principle a testable empirical claim. While it may be at odds with some behaviorist concepts, it may not be dismissed as inherently unscientific.

This argument can be generalized as a point about the degree of management. By degree of management I shall mean the degree to which the goals and procedures of an institution are specified and predetermined by some set of arrangements for the making and implementation of decisions. Generally, claims about the actual consequences of the degree of management of some social institution are empirical claims appropriately decided on the basis of empirical evidence. The position developed concerning freedom in education is one instance of a claim about the consequences of a certain degree of management. In effect, the position taken was that both an excess and a deficiency of management can retard the development of autonomy, or to put the point in positive terms the development of autonomy in education requires appropriately planned areas of choice--choices identified and provided to promote maximum growth. This is in part a thesis about the empirical consequences of a certain degree of management.

A second example may be taken from economics. Laissez-faire economics (which I shall assume to be essentially the claim that economic liberty increases productivity) is an empirical claim concerning the consequences of a degree of management, as are opposing claims which advocate varying degrees of and types of economic regulation. Here (one hopes) no one would seriously propose that proponents of laissez-faire economics are advocating a position which is some how unempirical or based on inherently unscientific views about human behavior. This is, I suspect, generally the case with respect to a variety of claim concerning the virtues of various type and degree of management of social institutions. There is no a priori reason to prefer views advocating a high degree of management to views advocating a minimal degree of management.

We may then look with interest at behaviorist views of management where it can be plausibly argued that a view which advocates a very high degree of management is held on quasi a priori grounds. Standard interpretations of the thesis that positive reinforcement increases the probability of behavior lead to the following view of

educational management. A properly managed educational environment requires essentially three ingredients.

1. An exhaustive list of the behaviors to be acquired by the student.
2. A list of devices for eliciting these behaviors from the student.
3. Properly arranged reinforcers to be applied when the desired behaviors are elicited.

It will suffice for the moment to comment on (1). It seems to be characteristically demanded by advocates of this view of management that educational goals be expressed not only in behavioral terms, but as a very specific list of behaviors such as to enumerate in detail precisely the behaviors which it is desired that the student should be able to exhibit as a result of his educational experience. I shall soon have more to say concerning exactly how we are to understand this view. Suffice it for the present to note that behaviorist views lead to a rather high degree of management. To take seriously such a view of management would surely foreclose the existence of the kinds of choice points which an education for autonomy requires. Thus, from the perspective of the view of an education for freedom that I have developed in this section, behaviorism involves an excessive degree of management. If educators are to direct their teaching toward the achievement of antecedently specified detailed lists of behavioral goals, it is hard to see how they can at the same time provide the kind of free space on which the development of autonomy depends.

That this view of management is based on a priori considerations rather than empirical evidence follows from the fact that it is a consequence of the theory of operant conditioning. As I have argued this theory cannot be understood as an empirically tested or empirically testable claim. Rather it represents a view about how empirical claims in the behavioral sciences are supposed to be formulated. Behaviorist views of educational management represent attempts to structure educational institutions along the lines suggested by their views on the nature of properly organized empirical claims.

We are now in a position to state some general conclusions concerning the implications of behaviorist syntax on views of authority and management. Four general conclusions seem warranted.

1. It is unlikely that an adequate view of freedom and authority can be worked out from a behaviorist perspective. A behaviorist perspective seems to systematically distort the concepts and questions necessary for even formulating the issues in a coherent fashion.
2. Behaviorists tend to reject empirical claims concerning the effects of freedom or authority not on the basis of empirical evidence, but on quasi a priori grounds.

3. A behaviorist viewpoint tends to lead to the replacement of questions of legitimate use of authority by questions of efficiency.

4. From the perspective of the view of education developed earlier in this section, behaviorist views lead to an excess of management.

In short, not only does a behaviorist viewpoint undermine an inquiry orientation toward education, but it also undermines the view of freedom in education which accompanies it.

I shall conclude this part of the argument with two lines of possible rebuttal concerning the above conclusions.

First, part of my claim has been that behaviorists tend to pose claims of legitimate authority as though we had a choice to make between control or the lack of control, but that in fact typical claims concerning the merits of a free and open society cannot be formulated in such a fashion. The behaviorist might retort that the behaviorist's conceptual framework has a rather plausible way of formulating the distinction between an open and a closed society. The distinction, so the retort goes, is nicely relfected in the behaviorist's distinction between positive and negative reinforcement. An open society is one in which people are controlled by positive reinforcement. A closed society is one in which control is attempted by negative reinforcement.

Skinner flirts with such a view in Walden Two. At one point he elaborates on the question of the merits of positive reinforcement in regard to freedom as follows:

> 'Now that we know how positive reinforcement works and why negative doesn't,' he said at last, 'we can be more deliberate, and hence more successful, in our cultural design. We can achieve a sort of control under which the controlled, though they are following a code much more scrupulously than was ever the case under the old system, nevertheless feel free. They are doing what they want to do, not what they are forced to do. That's the source of the tremendous power of positive reinforcement--there's no restraint and no revolt. By a careful cultural design, we control not the final behavior, but the inclination to behave--the motives, the desires, the wishes.'[72]

And a few lines later we read:

> 'Yet, it seems to be understood that governments will operate only

> through force or the threat of force, and that all other principles of control will be left to education, religion, and commerce. If this continues to be the case, we may as well give up. A government can never create a free people with the techniques now allotted to it.[73]

This is not an unattractive view of society. Insofar as a government has the right to control a person's behavior I prefer that this should be accomplished where possible through incentives rather than through coercion. Thus, while I would prefer that the position be stated in a less mechanistic vocabulary I believe that this aspect of Skinner's thought is humane and meritorious and in fact that it is well applied to educational situations. Nevertheless, as a view of the nature of an open society it suffers two defects. First, it has too few influence concepts. Giving evidence, criticism, and debate or other influence concepts are not obviously categorized as instances of either positive or negative reinforcement. Any view of legitimate authority must take such kinds of influence into account, but Skinner's views at best leave us hard pressed to know how they are to be treated. Second, an attempt to reconstruct the distinction between a free and a closed society in terms of the distinction between positive and negative reinforcement seems to be to answer the wrong question. In its liberal versions the basic issues of legitimate authority concern the extent of civil authority. They are views concerning the kinds of actions over which authority is properly exercised. Skinner's view, however, is a view about the kind of authority or control employed, not about the kinds of acts over which the authority is employed. Thus, it is implausible to suggest that it adequately mirrors the distinction between an open and a closed society.

The point can perhaps be made more forcefully by the following example. Consider the reaction that would likely be received by a government official who attempted to defend himself against the charge of press censorship by the claim that after all he had not threatened the concerned newspaper editor he had merely bribed him. Here the suggestion that the control was acceptable because it was positive reinforcement is rather beside the point. What is at issue is whether government officials ought to control the press at all, not whether they should employ positive or negative sanctions in doing so. Thus the distinction between positive and negative reinforcement is a fine distinction, but it is relevant to a different set of problems. That Skinner and other behaviorists have appeared to think that the distinction is sufficient to deal with the concerns of the liberal tradition in

political theory is merely additional testimony to the myopia which the conceptual framework of behaviorism induces.

The second retort which might be proffered by a behaviorist concerns my claim that the behaviorist's conceptual framework leads to a determination of empirical questions on a priori grounds. He will perhaps remind me that I claimed that with respect to viewpoints which provided a kind of syntax for empirical research the proof of the pudding is in the eating, and he will perhaps hold that I really have not shown that there are true propositions which behaviorism excludes, but merely that there are empirically meaningful questions which behaviorism rules out not because they have been empirically disproven, but because they are incompatible with behaviorist syntax. That, however, (so the rejoinder proceeds) is what a syntax for empirical research is supposed to do. That is, it is supposed to select from among the class of empirically meaningful propositions concerning a certain phenomenon a preferred class of propositions on which research is likely to be fruitful. But all that my argument has done is to suggest the kind of empirical propositions which wind up in the non-preferred class. And while I may have a view which treats these propositions as preferred objects of study, I have yet to do more than show that behaviorist syntax does have consequences (presumably it is supposed to) and that these consequences are different from the consequences of my own view. That is not sufficient evidence on which to base a rejection of the behaviorist point of view.

There is something to this response. That is, in part I have merely been pointing out the consequences of adopting differing points of view about human freedom and human behavior. It may be clear that they are incompatible. But it is not clear which is correct. Nevertheless, the following response is in order. First, part of my case has been to show that behaviorist arguments against certain views about freedom proceed largely by misunderstanding their point. Surely a behaviorist viewpoint does not excuse poor scholarship or distortion of the views of one's opponent. Behaviorists have in fact occasionally declared that libertarian views were simply anti-scientific. Insofar as I have successfully shown these arguments to be directed against a position rarely held I have shown that the behaviorist's case against such views fails. Second, in Section II A of this document I developed an argument intended to show that any view which was unable to formulate the concept of a reason for believing something was susceptible to a kind of a priori refutation. Insofar as I have shown that behaviorist views on authority or control stem from the inability to formulate just this kind of concept, behaviorist views on authority are also

susceptible to a similar a priori refutation. Finally, even if all that has been accomplished is that behaviorist and libertarian views on legitimate authority and on authority in education have been restored to a degree of equivalent respectability, that in itself is reason to maintain a healthy suspicion. In fact my argument has shown behaviorism to undermine conceptions of freedom and authority which are at the heart of American, indeed Western, ideals concerning law, government and the rights of man (for reasons other than the ones usually given by behaviorists). Even if these views should prove ultimately mistaken they are not the sort of thing to be treated flippantly, abandoned for the sake of a speculative behaviorist program of research, or lost to education as a result of this decade's educational fad.

I shall conclude this portion of the argument by commenting briefly on the consequences of a consistently applied behaviorism for the concepts of human responsibility and dignity.

The idea that people are responsible cannot be separated from the idea that they are free. 'Ought,' as they say, implies 'could.' That is, if we are to hold a person responsible for what he does we will have to hold that his actions are done freely. On the other hand, if it can be shown with respect to some action that the act was done under some kind of coercion or compulsion, i.e., that it was not done freely, then we are not entitled to hold the doer of the act responsible for it. Where a person has no choice he cannot be held responsible for what he does.

Since the question of whether men are responsible seems to turn on whether they are free, most of the discussion of freedom is relevant here as well. It follows, then, that a behaviorist viewpoint undermines the concept of responsibility for the same reason that it undermines the concept of freedom, indeed, because it undermines the concept of freedom. That is, behaviorism undermines the concept of responsibility because it is unable to formulate an adequate concept of rationality on which the concept of freedom and subsequently the concept of responsibility depend.

Of course, in the last few years it has become almost a sign of enlightenment to deny that the student is responsible for his own education. The accountability movement in education, for example, has tended to resist holding the student responsible for what he learns largely because it perceives that the ascription of responsibility to the student for learning is often a ploy used by the educator in order to escape his own responsibility. Doubtless, there is something to the charge. Thus, the denial of the student's responsibility for what he learns has

been part of a strategy intended to transfer the responsibility for the student's progress to the teacher or the school.

The following remarks are called for here: First, insofar as there is in fact the kind of conceptual link I have suggested between the concepts of reason and responsibility, it follows that immature students (when maturity is understood in terms of rational capacities) are not responsible for what they learn nor for that matter for anything else. Since maturity is a matter of degree and is presumably the sort of thing that increases with age, so is responsibility. It follows that college students are appropriately held responsible for a great deal more than are first grade children.

Second, people are appropriately held responsible for those things which are under their control and are not appropriately held responsible for those things which are not under their control. The teacher can control much of what he does in the classroom, and insofar as what the teacher does in the classroom actually has known consequences for learning, the teacher may be appropriately held responsible for what students learn. However, the teacher's influence is rather obviously not the only determinant of learning. It follows that the teacher is not in any simple fashion responsible without qualification for what the student learns. Thus, an ethically in order view of accountability will have to find a way of measuring the difference a teacher makes in the learning of students, not just the difference in learning.

Third, a consistently applied behaviorism provides very little aid and comfort to the accountabilist who wishes to transfer some of the responsibility for learning outcomes from the student to the teacher, for while it does follow from a behaviorist point of view that the student is never properly held responsible for what he learns, it follows also that the teacher is equally not responsible. Indeed, since behaviorists often claim (again correctly, but often for the wrong reason) that it follows from a behaviorist viewpoint that no one is ever responsible for anything he does, it is inappropriate on this view to locate the responsibility for the student's learning anywhere.

Perhaps then we need to ask the following questions of a behaviorist view of responsibility. First, what will be the educational consequences if students should begin to take seriously the idea that they are not responsible for learning? Before educators become overly enthusiastic about behaviorism in higher education, they would do well to consider the prospects of facing a class of students convinced by accountabilist rhetoric that getting an education is an affair for which they have no particular responsibility. Second, we should also ask what will be

the consequences of teachers and staff as well as students who correctly refuse to accept the responsibility for learning? While the answer can only be a matter for speculation, the prospects do not seem encouraging. A serious view of accountability in education requires that responsibility be correctly assigned, not that it be denied. Behaviorism entails that no one is ever responsible for anything under any circumstances. It is hard to see that a general acceptance of this viewpoint will produce desirable consequences.

The concept of human dignity also suffers some indignities at the hands of behaviorist ideology. Let me begin to elaborate the argument here by a quote from Immanuel Kant.

> Rational beings, on the other hand, are called persons because their nature already marks them out as ends in themselves--that is, as something which ought not to be used merely as a means--and consequently imposes to that extent a limit on all arbitrary treatment of them (and is an object of reverence). Persons, therefore, are not merely subjective ends whose existence as an object of our actions has a value for us: they are objective ends--that is, things whose existence is in itself an end, and indeed an end such that in its place we can put no other end to which they should serve simply as means; for unless this is so, nothing at all of absolute value would be found anywhere.[74]

Kant concludes his discussion with the following norm.

> Act in such a way that you always treat humanity, whether in your own person or in the person of any other, never simply as a means, but always at the same time as an end.[75]

Kant's notion that human beings are to be treated fundamentally as ends rather than means provides a useful way to formulate a concept of human dignity. What is of most interest in Kant's view is the suggestion that men are appropriately treated as ends rather than means because they are rational agents. Let me suppose for the sake of the argument that Kant is correct. It then follows from the behaviorist inability to formulate an adequate view of rationality that they will be unable to formulate the distinction between persons and things, that is between things which are rational agents and things

which are not rational agents. Moreover, from a Kantian point of view the inability to formulate an adequate view of man as rational agent has the consequence of relegating man to the category of thinghood. If it is the property of rationality which differentiates man from things, any view which is unable to formulate an adequate view of rationality will end up relegating human beings to the status of mere things. And, of course, once we are no longer able to formulate the distinction between men and things we will not be able to coherently apply Kant's principle to men, that is, we will not be able to justify treating human beings as ends in themselves.

The problem need not be given a Kantian formulation. Consider the following argument. First, it is essential to any adequate ethic that men be regarded as entitled to some kind of preferential treatment in relation to physical objects and lesser organisms. Things are appropriately treated as mere instrumentalities. We raise and kill animals for food and sport. They go where it serves human interests to have them go, eat when it serves human interests to have them eat, and die when it serves human interests to have them die. While there are arguments which indicate that it is morally appropriate to eliminate what needless pain and suffering that may be involved in this process, few would argue that there is something inherently unjust in treating animals and inanimate objects as mere instrumentalities in relation to human needs. Even the most ardent ecologists characteristically defend animate and inanimate nature from excessive exploitation in terms of what they perceive as human needs, such as the need for beauty. On the other hand, it is unthinkable that we should consider other human beings as mere instrumentalities. It is presumed that each man has a right to be treated as an end in his own right. He may, of course, be treated as an instrument for limited purposes, but he may not be treated as though his needs, wants and interests are entirely irrelevant to how he is to be treated or as though they have no claim on us for consideration when deciding how he is to be related to our purposes.

No doubt most people could be gotten to agree that human beings are appropriately given preferential treatment in relation to nonhumans and that the principle behind this preferential treatment is as Kant suggests that men are to be treated as ends in themselves, and not as mere instrumentalities. The question of interest, however, is as to how we are to justify such an opinion, and it should be clear that part of the defense of such an ethical principle will be the identification of what I shall call a relevant difference between people and things. That is, in order to justify the contention that men are entitled to receive preferential treatment to

things it is necessary (a) to identify some respect in which men systematically differ from things and (b) to show that this difference provides some reason for preferential treatment.

There are in the history of Western thought at least the following two views (not necessarily incompatible) about what this relevant difference is. The Judeo-Christian tradition maintains that it is the fact that man has been created in the image of God which makes him privileged in the order of nature. It is man's likeness to God which justifies his being treated as an end rather than a means. The second position maintains that it is man's rationality which entitles him to preferential treatment. One would be rather surprised to find behaviorists appealing to the theological position, and the Kantian position is not readily available to the behaviorist because of the difficulties behaviorism has in formulating an adequate concept of rationality. We are then entitled to ask how it is that the distinction between persons and things is going to be formulated from a behaviorist perspective. What is the behaviorist going to point to as the relevant reason for treating men as ends rather than means?

I am not aware of any argument which will show that a behaviorist cannot generate a coherent response to this question. Nevertheless, it is readily seen that a coherent response will not be especially easy to formulate within a behaviorist framework. If my argument is correct traditional views concerning the distinction between persons and things are not readily appropriated by behaviorists. They are not likely to claim that men are treated as ends rather than means because they are rational agents.

There is an additional difficulty. A part of typical behaviorist ideologies which has not been explored thus far in this work is the view that human behavior can be accounted for by the same laws of learning which are supposed to account for animal behavior. No doubt there are a number of different things such a claim could mean and interpretations of it to which the author would not be especially hostile. For the behaviorist the claim has characteristically meant that human behavior can be accounted for in terms of the same sort of associative laws which account for animal learning. Whether this claim is true is for the moment beside the point. What is pertinent is that the claim poses an additional conceptual obstacle in the path of providing a coherent account of the relevant difference between men and other organisms. If human behavior is explicable by the same general principles which account for animal behavior, what is the relevant difference we are going to point to in order to justify preferential treatment for men? Again nothing in this argument shows that the behaviorist cannot

provide a sensible response to the question. The argument does, however, suggest that the conceptual framework accepted by many behaviorists renders the question difficult to answer and the options few. (I do not profess to know how a behaviorist might in fact proceed here.) Thus, there is substantial evidence to suggest that behaviorist theories will ultimately result in the erosion of the distinction between persons and things.

Let us suppose for the moment that I am correct in this claim. What follows? In fact, it is not altogether clear what follows, for it is not altogether clear what specific duties the injunction to treat men as ends rather than means imposes, or if in fact the injunction imposes any specific duties at all. However, at least the following follows. Surely part of what is meant by the idea that men are to be treated as ends rather than means is that each person's needs, wants, interests, feelings and concerns are entitled to be taken into consideration in making decisions which effect him. It is hard to see what treating a person as an end would amount to if it did not include the notion that what a person wanted or needed was not entitled to at least a primia facie consideration as something deserving of fulfillment merely because they were the person's wants or needs.

Such a view has application to any discussion of legitimate authority or control over the individual. First, it is difficult to see how we could begin to make sense out of questions concerning the legitimate uses of authority without some recognition that persons are to be treated as ends rather than means, or without some notion that ultimately the uses of authority must be justified in terms of whether or not the wants and needs of persons are met. And perhaps the most general way to formulate the concept of an abuse of authority is to suggest that a person in authority abuses that authority when in using it he treats other persons only as means to his own ends. Without some concept of the primacy of the wants and needs of a person, it is difficult to see how we could begin to think about such questions.

The idea that persons are ends and not means and that, therefore, their wants and needs have a kind of primia facie right to consideration suggests also a different point of view from which to argue the moral superiority of persuasion to manipulation with respect to a person's wants or beliefs. To attempt to persuade a person that he ought or ought not to want or to believe a certain thing, to give him evidence which points to a certain conclusion, is to treat the person's wants and beliefs as his, as things over which the person has the power or right of control and which are not properly tampered with without the person's knowledge or consent. In effect, to attempt to persuade a person is to treat

him and his wants and beliefs with the respect due a person entitled to be treated as an end rather than a means. On the other hand, to manipulate a person often is to create wants, needs or beliefs which are not the person's in that they have not been chosen or perhaps even noticed by him. Insofar as this is what manipulation amounts to, to manipulate a person is to deny him the respect due a person and is to begin to treat him as an instrumentality. While the idea of manipulating a person for his own good is by no means contradictory or impossible, nevertheless, characteristically the reason for attempting to manipulate a person rather than to persuade him is that the manipulator believes that what he wished the person to want or believe would not be deliberately chosen by him if the person were to engage in a conscious evaluation of the options. In short, we are likely to want to manipulate a person when we wish to treat him as an instrumentality.

What follows from these arguments, thus, is not that behaviorists are somehow pernicious people or that they are engaged in attempting to dominate our lives and take away our liberty. Rather what follows is again that a consistently applied behaviorist outlook appears to have conceptual consequences which make it very difficult if not impossible to formulate some ideas and distinctions which are of considerable ethical import not only in education but in a variety of areas of life. In this case the distinction between persons and things is eroded with the likely consequence that additional good reasons for not engaging in excessive management of the lives of other persons become unintelligible from a behaviorist point of view.

At this point it will be helpful to summarize the argument of parts A and B of Section III. I have in these sections attempted three things:

1. I have sketched a view of freedom in education and have articulated its general values, goals and procedures. Particularly I have argued that certain goals of education presuppose certain kinds of liberty as part of a proper educational environment.
2. I have attempted to show, not that this view is true, but contrary to typical behaviorist argumentation that it is scientifically respectable in that it can be expressed by means of empirically testable claims.
3. I have attempted to show that a consistently applied behaviorist viewpoint undermines this view of freedom in education not because it is somehow more scientifically respectable but because it is conceptually impoverished and is thus unable to formulate the concepts necessary for a coherent statement of the issues and problems.

Is this problematic? Let us suppose that I am right in my assessment of the logical consequences of a consistently applied behaviorism and that behaviorist views are becoming increasingly influential in educational theory, is there any reason to suppose that such consequences will begin to appear in American education or any evidence that they have in fact appeared? This is the question which I shall address in the next section.

c. Behaviorism: Some Possible Outcomes

The argument of the previous section (III B) entitled us to few, if any, predictions concerning what the effects of behaviorist ideas in education will actually be. This is the case for two reasons. First, it is not clear as to the extent to which education is actually being influenced by behaviorist ideas, and second, even when the influence is clear the "ideological purity" of the influence is unclear. The reader will have noted that the predictions of the previous section were as to the "logical outcome" of a "consistently applied" behaviorism. But I have already suggested that often the outcome of contact between behaviorist concepts and the real world of human behavior is that the concepts are emasculated in order to stretch behaviorist doctrines to fit the phenomena. It is also worth noting that some of the logical outcomes of behaviorist doctrines were found at the ends of rather complicated and involved arguments--arguments which have not occurred to any behaviorists of whom I am aware. Of course, one of the best reasons for believing that a person will not do some action, A, which appears to be required if the person is to act in ways consistent with his beliefs is that he does not realize that A in fact follows from these beliefs. Thus, there is a kind of logical slipage between what a behaviorist program may logically require and what it may in fact produce. These facts indicate that the problems of translating the gedanken experiment of III B into a prognosis are formidable. Thus, while I do wish to enter here into a discussion of the prognosis for the influence of behaviorist ideas on education, the results can at best be speculative and tentative and since the reader can doubtless speculate on such subjects as well as I, I shall also be brief.

There are two likely ways in which behaviorist ideas might influence educational programs and outcomes in relation to freedom ideals. On one hand the effect of behaviorist ideology may be to directly undermine or render implausible appropriate freedom values with the consequence that educational procedure is altered to match. On the other hand, behaviorist views concerning the management and organization of educational programs may be a vehicle for importing behaviorist influence into education.

I shall begin with the former possibility. Once the education profession is persuaded that children are not free, responsible, active agents, or that they cannot be made so, it is reasonable to expect that educators will stop acting in ways which assume the contrary. Such a change may not be immediate. Indeed it may take many years since it often takes considerable time for people to recognize the ultimate implications of their value commitments and even longer for such a realization to overcome the inertia of fixed behavior patterns and vested interests. Nevertheless our ideological eggs usually produce their behavioral chicks sooner or later. If we convince ourselves this decade that freedom ideals are nonsense, one suspects that in a decade or two our acts and educational programs will reflect this assumption.

Consider the following example taken from Leon Lessinger's Every Kid a Winner. Accountability in Education, a book which has been important in the accountability movement.

> This right to know is not satisfied by providing a school desk for the child, putting books in front of him, and having a teacher go through the steps of a specified curriculum. It is satisfied only by objective proof that, after going to school, he can exercise the necessary skills and apply his knowledge. We are talking about demonstrable results, not merely ten or twelve years' exposure to a program that may offer a measure of success to some of the children (or even to most of them). In a sophisticated technological society, each child has a right to be taught a mastery of the essentials, by whatever means are necessary.
>
> Stated in this way, the point seems indisputable. Who would argue that, as a matter of policy, we ought to allow a significant fraction of our children to go into the adult world without the means for earning a decent living or being responsible citizens? Yet that is what we do. In other spheres we do much better. In building rockets we engage in "zero-defect" programs of quality assurance, for we know that if a single part fails, the rocket fails. Can we not find ways to do as well for our children?[76]

Lessinger later claims:

> Under the new mandate, schools are asked to give each student the competence he needs, regardless of the difficulties; and that means regardless of his initial or apparent interest, his cultural background, his home life, or his ability as measured by culture-bound tests. In effect, this act asks the schools to guarantee the acquisition of necessary skills.77

What I find interesting about these otherwise rather innocent and somewhat agreeable ideas is their assumption of the complete passivity of the student. Education is conceptualized on a production model. Learning is the product, teaching is the production process, the child is the raw material. Learning is something done to the child. Accountability is illustrated by quality control examples. On such a model it is, of course, objectionable to limit the schools obligation to the child to that of providing adequate resources for learning. If the child is treated as essentially something which undergoes learning, it makes about as much sense to say to the child, "Here is the opportunity to learn; avail yourself of it" as it does to say to a sheet of metal, "Here is the assembly line; make yourself into a car." According to Lessinger we can guarantee that the child learns. Indeed, we can guarantee that he learns whether he wants to or not. Our obligation to "learn" the child extends even to cases where the child has no interest in learning. Thus, the child is not expected to avail himself of the opportunity, nor is he assumed to be responsible for doing so. The responsibility appears to be the school's alone. The resistance to being "learned" on the part of the child is understood much in the way that a defect in some raw materials would be treated on an assembly line. It is something to be remedied. It receives none of the consideration that the wants or interests of free agents ought to receive even if they ought to be ultimately overruled. The child has a right to be done unto whether he likes it or not. (Note that a right to have something done unto you whether you like it or not is a very odd right and a very poor precedent.)

I have already suggested that I do not have any particular objection to holding educators responsible for what they can in fact control, and since they can presumably control events which influence learning I have no great difficulty in making judgments concerning an educator's success in terms of general levels of student performance. Indeed, since Lessinger is largely concerned

with elementary reading and mathematical skills and, thus presumably with younger children whom I have argued are not to be treated as though they were fully responsible moral agents I do not find his remarks overly problematic. Nevertheless, the ease with which it is assumed that the child is entirely passive in his own education and indeed the apparent assumption that the resulting view of accountability is indisputable and obvious gives pause for reflection. The fact that many accountabilists would find Lessinger's comments to apply to almost any educational situation at any level raises concern. If we extrapolate the trend a bit there is some reason to wonder whether or not educators and students alike will not soon begin to find accountability an oppressive doctrine undermining the student's freedom of choice in education, eliminating his responsibility for his own education, and loading excessive responsibility on the teacher.

I would submit that the assumption of the passivity of the student, an assumption clearly required if the educator is expected to guarantee results, is not obvious.

One is then led to wonder why it seems so obvious to Lessinger and is becoming increasingly obvious to others in education. No doubt there are many reasons. It is not, however, implausible to suggest (although likely it is impossible to prove) that a major influence has been the erosion that freedom ideals have undergone at the hands of the language system of some of the behavioral sciences. If I am right in my guess concerning the intellectual background of the "obviousness" of the passive language in which Lessigner's view of accountability is couched and if I am right in my view that the clash between the behavioral sciences and freedom values is based on a mistaken view about the nature of freedom--even so, the example taken from Lessinger is fairly innocuous. But the trend it suggests is ominous and would appear to pose a serious threat not only to freedom in education, but to basic civil liberties. It should be quite clear that a variety of civil rights and liberties depend on thinking of man as a free, active, responsible agent, and will not long survive the intellectual habit of conceptualizing human behavior in a basically passive language. There is, thus, some reason to believe that educators are moving toward the adoption of a behaviorist-like conceptual framework which will prove corosive of freedom in education.

It is worth adding that it is not clear in many cases that this type of passive language which is finding increasing employment in the professional jargon of educators reflects any kind of explicit commitment on their part. (One suspects that Lessinger might be both surprised and wish to repudiate the commitments which I have suggested seem embedded in the way in which he formulates his notion

of accountability.) This is not particularly surprising, but it does suggest some interesting properties concerning the way in which a conceptual change often takes place. For most people, such a conceptual change is often a result of adopting the verbal habits which prevail in a new sub group. For example, students often enter an education program talking about what children do and about how to teach them and leave talking about their behavior and how to change it. That is they tend to adopt the common language patterns which are extent in at least a large part of the academic educational community. But in doing so they make a change from a rather active language--one which facilitates thinking of man as free and responsible, into a rather passive language--one which makes it difficult to think of man as an agent and easy to think of him as an object of manipulation. It is doubtful that in very many cases such a change in verbal habits reflects any intellectual commitment, but it may lead to some. It may lead to some just because it is a passive language and thus will make it difficult to express coherently or easily ideas which assume that man is a free active agent. The language has hidden commitments. Thus, the student who has undergone such a language change is likely to wake up some morning to discover that his values about education have also changed, not because he has changed them, but because his verbal habits have altered what it seems possible to say or plausible to think.

I doubt that American educators are likely to be argued out of their historical commitment to thinking of education as an instrument for the liberation of individuals. One suspects that reading Beyond Freedom and Dignity is unlikely to affect wholesale ideological changes in the profession. However, I believe that the danger is real that American educators will undergo a transformation in educational values which will be caused partly by the hidden conceptual commitments of prevailing jargon. Educators need to take seriously how they talk and to be careful that they mean what they say. If we must have a behaviorist world view, let us at least choose it.

Behaviorism implies not only some negative attitudes toward freedom values but also a view of educational management, one aspect of which is that the goals of education require translation into a set of behaviors to be acquired. Such objectives are commonly referred to in the literature as behavioral objectives. In what follows I shall explore the possibility that the behavioral objectives movement may prove a vehicle whereby behaviorist ideology is imported into education.

In working out this argument it is first necessary to discuss the details of a difficulty in interpreting the requirements of a behavioral objectives program. I wish

to suggest that there is an empiricist as well as a behaviorist interpretation of behavioral objectives and that difference between their requirements while subtle is most important.

I shall begin with a brief statement of what appears to be the basic argument for behavioral objectives in education. Behavioral objectives are essentially the answer to the question of how we recognize success in achieving our intended goals. If we are to know what we are doing (the argument goes) we must have clear and precise goals. If we are to know if we have achieved our goals, we must have testable goals. If our goals are to be testable, they must be identifiable by means of some observable event. And, of course, the observable events by means of which we identify whether or not someone has learned something are his behaviors. It follows that we can only recognize success in education when our goals are of the sort such that we can decide when we have accomplished them by observing the behavior of the student.

The argument is open to two kinds of interpretations which I shall call empiricist and behaviorist.

The empiricist interpretation is as follows. On the empiricist interpretation of behavioral objectives an educational objective, O, is permissable if there is some behavior, B, such that B is a reasonable test under appropriate specified circumstances for O. It should be noted that this is a fairly weak requirement. It does not require that educational goals be stated as behaviors or translated into a behavioral language. Nor does it identify educational goals with some behavior to be acquired. It requires only that educational goals be capable of identification by means of some kind of empirical evidence.

The behaviorist interpretation is considerably more demanding. Consider again the two central doctrines of behaviorism, peripheralism and associationism. Peripheralism, I have suggested, is essentially the application to psychology of the demand that in a scientific language all non-logical terms must refer to observable objects or events or be exhaustively analyzable into such terms. The consequence of this doctrine is to limit the non-logical vocabulary of psychology to imput and output variables or stimulus and response. Associationism adds to this the demand that all learning is to be accounted for in terms of acquired connections or associations between some S and some R. Together these doctrines yield a view of learning in which learning is understood as simply a change in the connections between stimulus and response. The view can be simplified by the slogan, "What one learns is behavior." This view also leads to a view of behavioral objectives, but a somewhat different one. It requires any permissable educational goal to be exhaustively analyzed into a finite list of behaviors to

be acquired, and it identifies the educational goal with the acquisition of this set of behaviors.

Empiricist and behaviorist interpretations of behavioral objectives can be compared on the following points.

1. For behaviorism behavior is the objective. For empiricism behavior is merely evidence that the goal has been achieved.

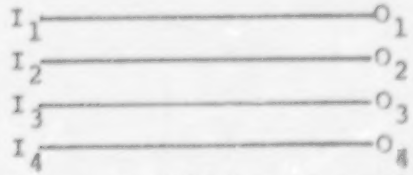
2. Behaviorism is hostile to any goal which cannot be expressed as a finite list of behaviors. Empiricism is hostile to a goal only if that goal is incapable of being tested for empirically.

3. Behaviorism requires that education be thought of as solely the acquisition of a behavioral repertoire. Empiricism need not be hostile to the idea that in some cases education is concerned to teach a behavioral repertoire, but it can also be interested in other sorts of objectives.

4. Behaviorism is hostile to all goals expressed in a cognitive language. Empiricism merely requires that such goals be capable of empirical identification.

5. Behaviorism tends to atomize educational goals. Empiricism does not. (This requires explanation.) Consider first that one of the virtues of a theoretical vocabulary in any science is economy, second that a cognitive language is part of the theoretical vocabulary of psychology, and third, that cognitive states are often educational goals. It follows that one price of eliminating cognitive goals from an educational objectives language is loss of economy. A cognitive skill term can be looked at as having the role of summarizing the claim that a certain class of imputs will produce a certain class of outputs.

If we drop such terms from our language, we are then faced with the task of formulating each imput-output connection as a separate instance.



For example, if we are unwilling to employ a concept such as understanding Modus Ponens in our goal language, we will find that we shall have to express each conclusion of

a Modus Ponens argument as a separate goal and to treat each "association" between a given set of premises and its conclusion as a separate learning task. Obviously our goal language will suffer considerable loss of economy and will undergo substantial atomization. (The reader will recognize that this is merely an application of part of the argument of Section II B.)

Note that the central difference between the two views is the fact that behaviorism tends to identify educational objectives with the evidence for them. The behavior is both the goal and the evidence that it has been achieved. (Even the name "behavioral objective" exhibits this behaviorist bias.) Empiricism permits a distinction between the objective and the behavioral evidence that it has been achieved. It should also be kept in mind that the usual arguments for behavioral objectives appear to require only the empiricist view although they do not preclude a behaviorist one.

Obviously behavioral objectives are at the center of a great deal of educational change these days from accountability to performance contracting to performance based teached training. Is the interpretation of behavioral objectives typically employed in such programs empiricist or behaviorist, and is there any reason to believe that any of the dire consequences which I have argued are the logical outcome of a consistently applied behaviorism will be actualized in our schools by the increasing use of behavioral objectives. Unfortunately, I suspect that the answers to these questions are "sort of" and "maybe."

I shall argue the following two claims:

1. That paradigm instances of the writings of behavioral objectives advocates on the subject do exhibit some "quasi-behaviorist leanings." (Note that this claim is to be clearly distinguished from the claim that these authors are behaviorists.)

2. There is reason to believe that these quasi-behaviorist leanings will produce some of the educational consequences which I suggested followed from a consistently applied behaviorism.

(Again, I wish to be quite cautious in these claims. Obviously there is no reason to assume that there is ideological uniformity among behavioral objectives advocates, nor that people who are developing programs employing behavioral objectives are bound by the views of the movement's publicists. Indeed those persons whose work I am most familiar with among my colleagues who are concerned with behavioral objectives seem to exemplify fairly consistent empiricist viewpoints.)

I shall select as my paradigm of a viewpoint on behavioral objectives Robert Mager's Preparing Instructional Objectives. I suspect that the reader who has any

degree of familiarity with the literature on behavioral objectives will readily grant its suitability as a paradigm case and that the viewpoint is typical if not pervasive.

Let us look at some passages. The first paragraph of a chapter entitled "Why We Care About Objectives" reads,

> An objective is an intent communicated by a statement describing a proposed change in a learner--a statement of what the learner is to be like when he has successfully completed a learning experience. It is a description of a pattern of behavior (performance) we want the learner to be able to demonstrate. As Dr. Paul Whitmore once put it, "The statement of objectives of a training program must denote measurable attributes observable in the graduate of the program, or otherwise it is impossible to determine whether or not the program is meeting the objectives."[78]

Here we see a comparatively obvious and clear instance of what I suggested was the central feature of a behaviorist viewpoint. The educational objective and the behavioral evidence that it has been achieved are not distinguished.

This is soon followed by an expression of the dubiousness of objectives stated in a cognitive language.

> Though it is all right to include such words as "understand" and "appreciate" in a statement of objective, the statement is not explicit enough to be useful until it indicates how you intend to sample the "understanding" and "appreciating." Until you describe what the learner will be DOING when demonstrating that he "understands" or "appreciates," you have described very little at all. Thus, the statement that communicates best will be one that describes the terminal behavior of the learner well enough to preclude misinterpretation.[79]

(I find it odd that cognitive terms such as "understand" or "appreciate" are all right since they seem not to be the educational objective and indeed describe "little at all." Presumably Mager is willing to exhibit a little largess to those of us with cognitivist hangups so long as we do not forget the behaviors.)

The following discussion of music appreciation is perhaps most interesting and most puzzling.

> Though I can understand how you might say that "To develop an appreciation for music" is stated in performance terms, you are not correct.
>
> Let's ask the key question of this objective. What is the learner DOING when he is demonstrating that he has achieved this objective? What is he doing when he is "appreciating" music? You can surely see that, as now stated, the objective does not give the answer. Since the objective neither precludes nor defines any behavior, it would be necessary to accept any of the following behavior as evidence that the learner appreciates music:
>
> 1. The learner sighs in ecstasy when listening to Bach.
> 2. The learner buys a hi-fi system and $500 worth of records.
> 3. The learner correctly answers 95 multiple-choice questions on the history of music.
> 4. The learner writes an eloquent essay on the meanings of 37 operas.
> 5. The learner says, "Oh,man, this is the most. It's just too much.80

Here it is not clear whether Mager is providing a behavior repertoire to be substituted for the meaningless term "appreciation" or whether he is suggesting the sort of empirical evidence we ought to look for if we are to identify an instance of appreciation. Let us suppose for the moment that he is doing the former. Well, then our objectives are to get the learner to sigh, buy, answer, write, and say in the ways specified in Mager's illustration. We then have a classical example of the kind of atomism and trivialization to which the application of a behaviorist interpretation of behavioral objectives might be expected to lead. The substitution is also clearly objectionable and leads us to observe that sighing and buying are not what is meant by appreciating, that appreciating is more than sighing and buying, and that one could easily imagine that students could be gotten to sigh and buy without getting them to appreciate. Indeed, it is arguable that to aim at sighing and buying makes this probable.

Then let us try an empiricist interpretation of Mager's illustration. Let us treat sighing and buying as mere evidence that our objective of getting the child to

appreciate music has been accomplished. First, such an interpretation seems difficult to reconcile with the earlier passages. It clearly requires a distinction between educational objectives and the behavioral evidence that these objectives have been achieved, a distinction that Mager apparently rejects. (It follows immediately from an empiricist interpretation that the claim that educational objectives should refer to or denote behavior is false.) Nor can this interpretation be easily reconciled with the view that cognitive terms such as appreciating are meaningless. If we accept an empiricist reading of the example, then Mager will have to explain to us how it is that sighing and buying manage to clarify appreciating. (Note that I am not suggesting that sighing and buying are not clear. However, on an empiricist interpretation of Mager's remarks they will have to clarify appreciation.) No doubt sighing and buying are under proper conditions reasonable evidence that someone has learned to appreciate music, but how do they clarify the concept? It is doubtful that having noted the sorts of things which Mager treats as evidence for appreciation the normal English speaking person would better understand what was meant by appreciating. That these pieces of evidence should breathe meaning into an otherwise meaningless phrase is absurd. Indeed, it is puzzling to inquire how we could proceed to decide what counted as evidence for something like appreciation unless we already understood what it meant to appreciate. The very attempt to operationalize a concept presupposes that it is meaningful.

Thus, this example places Mager on the horns of a dilemma. If he accepts a behaviorist interpretation of it, it provides an excellent case against his program. If he accepts an empiricist reading then a good deal of what he has said concerning the nature and respective merits of behavioral objectives and non-behavioral objectives (claims which have become the stock and trade of the movement) is nonsense.

Of course, it is pointless to attempt to decide which interpretation is the correct one. It is more plausible to assume that Mager is simply confused and that no consistent interpretation is going to be forthcoming. (Although the fact that Mager's book is obviously intended as an elementary text, not a philosophical treatise, is mitigating.) More to the point is that these kinds of confusion are commonplace among educators these days. No doubt one will find few fire breathing behaviorists among the educators who have set forth to reform education with behavioral objectives. There is, however, reason to believe that one will find countless assertions and practices which are ultimately justifiable only on behaviorist grounds. Whether the asserters or practitioners

actually ascribe to these grounds is irrelevant so far as the consequences of their actions is concerned.

If it is granted that there is some tendency to confuse educational goals with the evidence that they have been achieved, then it will be profitable to inquire as to the consequences of this confusion. I want to suggest that there are at least two consequences, a demand for a high degree of specificity of educational objectives and a tendency to greatly proliferate the number of such objectives. (The reader will, of course, recognize that a demand for specific and exhaustively innumerated educational objectives is a common part of the ideology of behavioral objectives and that specificity and exhaustiveness is a common feature of the objectives of educational programs which take their behavioral objectives seriously.)

The reason that failing to distinguish educational goals and the behavioral evidence that they have been accomplished leads to specificity and exhaustiveness is essentially that it leads the educator to aim at the level of assessment. That is, the educator is led to aim directly at creating in the student those behaviors which are thought to be the evidence for having achieved the educational objectives. While a particular educational goal may range over a large number of possible behaviors the events which constitute the evidence that such a goal has been achieved are always specific events. For example, a person who understands Modus Ponens has available a wide range of potential verbal responses depending on the particular features of the premises which he is given. But one cannot exhibit a comprehension of Modus Ponens generally without exhibiting some specific verbal response. The evidence that a person understands Modus Ponens is always some specific occurrence, some specific instance of Modus Ponens behavior. In short, the evidence for even the most general goal is always some specific occurrence. Obviously a failure to adequately distinguish goals and the evidence for them will generate a demand for highly specific goals.

The demand for specific objectives generates a demand for exhaustive lists of goals as a corollary. Part of what is meant by a specific objective is that it does not cover a large number or a wide variety of types of instances. But then no particular objective is very much of an objective. To have specific objectives add up to a significant educational program will require a lot of them. In effect, the consequence of failing to distinguish between educational goals and the evidence for them is that educators are led to substitute a large number of highly specific goals for a smaller number of more general goals.

Note that I am not claiming that large numbers of specific goals are not for some educational purposes

superior to few general goals. I suspect that the proper level of specificity for educational objectives will vary with our purposes in articulating goals and with the kinds of goals with which we are dealing. My purposes are to examine the sources and the consequences of a rather doctrinaire insistence on specificity.

An empiricist interpretation of behavioral objectives does not involve any demand for either specificity or exhaustive innumeration of goals. (Nor does it exclude such goals.) It demands only that educational goals at whatever level of generality they may be stated be capable of being tested for empirically. This demand does, of course, require that general goals (specific ones too) be sufficiently clear or clarifiable so that appropriate operational definitions can be generated with a reasonable degree of accuracy. There is, however, no a priori reason (apart from a behaviorist viewpoint) why general goals are any less susceptable of operational definition than specific ones. No doubt the internal logical structure of general goals will tend to be more complicated than that of specific goals, and thus it will be more difficult to provide adequate testing procedures for them. To treat this as an objection to general goals, however, amounts to a decision to make choices about educational goals by employing as a criterion the ease with which a goal can be handled by current measurement strategies. One suspects that few people will be willing to identify explicitly the good with the easily measured.

We need to ask, then, as to the consequences of a systematic demand for specific and exhaustively innumerated educational objectives. No doubt in most cases the effect will be innocuous and in many cases beneficial. But we need to identify the hidden agenda in the demand and, thus, to ask if such a demand is likely to cause the disappearance of some kinds of educational goals or exert an influence on what is perceived as educationally worthwhile.

Here I shall argue the following claims:

1. Goals which tend to have a large number of varied exemplifications will be eroded. Included are many cognitive goals and autonomy.

2. Choice points for the student will be eroded.

Appreciation will serve as a useful illustration of what is meant by a goal which has numerous and varied exemplifications. The exemplifications of appreciation are numerous in that appreciation can be manifest in a large number of cases. One who appreciates music may be expected to exhibit his appreciation in virtually numberless instances given suitable occasion. Further, these instances may be highly varied depending on the antecedent circumstances. They may be varied in that particular exemplifications of appreciation may differ widely from

each other. Cases may range from Mager's sighing and buying to enjoying a good performer.

It is reasonable to expect that goals which exhibit this property of having numerous and varied exemplifications will be substantially eroded by the demand for specific and exhaustive innumeration of objectives. The assumption here is that such goals are not equivalent to any finite list of their exemplification. It immediately follows that any attempt to replace such goals by a finite list of their exemplifications is unworkable and may be expected to effectively eliminate such goals together with the numerous and varied potential behavioral repertoire implied by it, substituting at best a much narrower and limited set of goals. To aim at sighing and buying instead of appreciating is to get sighing and buying, but not appreciating. (Unless, of course, one is lucky and gets more than he aimed at.) This, of course, does not follow if sighing and buying are treated as tests, not goals.

For our purposes, there are two interesting types of educational goals which exhibit this property of having numerous and varied exemplifications. First, the sorts of things which may be called cognitive structures or intellectual skills tend to have this sort of property. The reader will recall, for example, in the discussion of Bruner in Section III B that emphasis was given to concepts or strategies which were possessed of a high degree of transfer or generativeness. In developing a curriculum or preparing a lesson, one is supposed to seek those kinds of concepts or ideas which can apply in a variety of diverse situations and which enable a person to generate an appropriate response to novel situations. It is the "structure of knowledge" which is most appropriately taught, not the details of knowledge, and it is more appropriate to emphasize broad competencies than specific performances. The point is, of course, that the kinds of concepts or skills which fit Bruner's specifications are just those which have the property of having numerous and varied exemplifications, and it is just these sorts of concepts and skills which are apt to disappear when a demand for specific and exhaustive objectives is forced.

The difficulties that the demands for specificity and exhaustiveness pose for a view of education which includes among its goals an interest in teaching intellectual skills can be further illustrated by asking how we would formulate the learning objectives for an intellectual endeavor where even the conclusions of the inquiry are in doubt. Term papers provide a useful example. Their function (or at least a common function) is to provide the student practice in applying the intellectual skills extent in a discipline. What skills? Well that is hard to say unless an answer like "the ones necessary to resolve the selected issue" will suffice. It is not that

there are not in fact particular intellectual skills which have or could be given names. Rather the difficulty is predicting prior to the conduct of some inquiry which of these skills will be called into play. And the difficulty is compounded for those disciplines where the intellectual skills and standards of judgment have not been systematically delineated or catalogued (as is the case for most disciplines). It is notable that students learn from engaging in such enterprises and that success in others can be recognized both without the use of specific objectives. The student can and often does learn the standards and skills for thinking within the confines of a certain discipline through research where he comes upon models of competent performance and through the feedback which he receives on his own work. And a competent practitioner of some discipline can almost always recognize a competent piece of work and can almost always recognize mistakes although he can rarely predict the specific features which a competent piece of work will exhibit or the points at which a less competent piece of work will go wrong. (In almost any enterprise where judgments of any sophistication are required recognition of success requires a competent observer.)

And what is the outcome of an inquiry supposed to be? I suspect that the answer to this question is that the student should be expected to provide a reasonable opinion. And again a reasonable opinion is the sort of thing a competent person can usually recognize when he sees one, but it is impossible to predict what its specific features will be prior to receiving an instance. (Surely, for example, all of us have seen two competent and reasonable cases made concerning some issue which arrive at opposite conclusions.) It is not obvious then how we are to go about formulating specific objectives when we are dealing with intellectual skills, or when we are thinking of education as a context for inquiry. Indeed, intellectual skills are characteristically and effectively learned in apprentice-like situations where the initiate learns by the example and feedback provided by a competent practitioner and where specific objectives not only are not necessary, but would appear to be a positive hindrance.

The conclusion is that the more that the demand for specific behavioral objectives is pushed, the more difficult it becomes to conceive of education as involving inquiry or as concerned to transmit cognitive structures or intellectual skills.

A moments reflection will reveal that autonomy is also the sort of goal whose exemplifications are numerous and varied. Indeed the ways in which autonomy can be exhibited are nearly as numerous and varied as the ways in which people can act. Consider that autonomy or psychological independence is a property which all of us

commonly note about the acts of other persons. Every teacher, for example, will quickly note which of his or her pupils are easily manipulated by peer group pressure and which are not. That is a judgment about autonomy. But an attempt to reduce autonomy to some finite list of its exemplifications is obviously not going to succeed. It follows that autonomy will not be among the objectives of an educational system where the objectives must be specific and many.

The exhaustive innumeration of specific objectives easily leads to elimination of choice points for a student especially when linked to the demand that such objectives be stated antecedently to the education situation. Consider the following remarks by Lessinger.

> The Importance of Specific Performance Criteria
>
> The key to this process is the framing of objectives in terms of performance. Let us see why. If I live in Detroit and have as my objective a visit by road to Los Angeles, it is not sufficient merely to be told that the direction is southwest. I need more specific instructions. Similarly in education, the general direction of faculty to teach students "to understand and appreciate science" is insufficient. To be useful, the general direction must be supplemented with a set of operational steps. Thus we might supplement the science objective mentioned above by listing such projects as the dissection of a frog in a science laboratory, or we might ask the student to demonstrate an application of Ohm's Law in an experiment with electricity.[81]

Of course, there is something to Lessigner's remarks. Obviously one cannot understand science generally without being able to do some specific things such as dissecting a frog or applying Ohm's Law. A student exhibits his understanding by doing specific things. But to select from the numerous things which a student might do in order to exhibit his understanding of science and to pronounce these specific things as the objectives to be accomplished in a certain segment of science teaching robs the student of whatever opportunity he may have had to have some input into the decision concerning the particular way in which he wanted to learn science, and it thereby robs him of the educational value which accrues to the making of such choices. In short, the demand for specific and numerous educational objectives stated antecedently to

the educational situation easily leads (insofar as the theory of freedom in education developed in Section III A is concerned) to excessive management. This difficulty is obviously compounded when the demand that educators be accountable leads to the development of such objectives in situations far removed from the flexibility of the individual classroom, requires them to be measured by standardized tests, and on occasion freezes them by writing them into accountability legislation or contractual commitments.

It would appear, then, that a systematic demand for specific and exhaustive behavioral objectives leads to difficulty insofar as conceiving of education as a process of inquiry is concerned, and leads to excessive management of the educational environment. These two defects are, of course, two of the difficulties which were held to follow from a consistently applied behaviorism. In relation to freedom in education, it does seem, then, that the behavioral objectives movement and associated types of educational reform offers some cause for concern so far as we wish to find a place for freedom in education.

The argument here warrants the following conclusions.

1. The types of educational reform discussed in Section III C are "quasi-behavioristic" in that they often seem to speak the passive language of behaviorism and in that they accept positions and exhibit procedures which require behaviorist assumptions for their justification.

2. These reforms are being carried out in a way which appears to carry behaviorist assumptions into educational practice and which, therefore, is threatening to appropriate kinds of freedom in education.

These conclusions must, of course, still remain quite tentative. Their verification would require not only a study of the ingredients of actual programs based on behavioral objectives, but a study of the results of applying these programs over a period of years. In Section III C the argument has moved from a study of the logical outcome of applying certain theoretical positions in educational practice to a study of the pronouncements of educators influenced by these positions. Programs and their actual consequences have not been studied. While the pronouncements of authors such as Mager and Lessinger undoubtedly provide some evidence concerning what programs dependent on behavioral objectives will look like, they hardly provide adequate evidence. What they do provide is reason for caution and concern and a motive for the examination of the assumptions on which reforms are based. What the arguments of this work show if anything is that these quasi-behaviorist reforms have something of a hidden agenda, they are not merely value neutral ways of stating our objectives and deciding whether we have achieved them. They have a potential for effecting a

marked change in our objectives. Many educators unfortunately have seemed to adopt an "I don't care what they assume as long as they work" attitude toward these educational reforms. That seems to me to be an excellent formula for letting one's values happen to one. At least care should be taken to identify the hidden agenda of educational change so that we can decide if the price is necessary and worth it. I suspect that the hidden agenda of these quasi-behaviorist reforms is neither necessary, nor worth it.

CONCLUSIONS

The conclusions are summarized by section.

Section I:

1. Human beings are free to the extent that their behavior is susceptible of being given a reason-explanation.

2. This view of human freedom is compatible with the existence of a science of behavior and the scientific explanation of free acts. The question of human freedom turns on neither whether behavior is explicable, nor on the logical form of an explanation of behavior, but is a matter of the kind of theoretical concepts employed in explaining behavior.

Section II:

1. In order to formulate an adequate concept of reasoning, it is necessary to employ some concepts of logical syntax in constructing the non-logical vocabulary of any psychology which purports to explain reasoning.

2. Standard cognitive psychologies in fact construct their vocabularies in this way.

3. The commitments to peripheralism and to associationism exhibited by most behaviorist theories preclude the use of such concepts so that those behaviorist psychologies which rigorously adhere to these doctrines exhibit inadequate concepts of reasoning while "behaviorist" theories which exhibit an adequate concept of reasoning implicitly abandon these basic behaviorist ideas.

Section III:

1. An adequate theory of freedom in education leads to the view that activities such as giving reasons, investigating, collecting evidence and evaluating are central to the educational process. This view is in no way anti-scientific.

2. A consistently applied behaviorism undermines such a view of education because of its inability to formulate an adequate concept of reasoning.

3. "Quasi-behaviorist" educational reforms such as accountability and the behavioral objectives movement (in some of their formulations) may be the vehicle whereby the anti-freedom possibilities of behaviorism are actualized in educational practice. This is the case because they speak a passive language in which freedom ideals are not easily expressed and because they demand that educational objectives be specific and numerous which undermines treating education as a process of inquiry and eliminates the "choice points" for the student which are a central part of an environment which produces autonomy.

The reader will recall that I introduced this work by noting that educational reform appeared to be moving in two incompatible directions exhibiting considerable interest in increasing freedom on one hand, but on the other emphasizing the control and management of the educational environment. If I am right in my contentions that there is nothing unscientific about freedom and that it is not control or management which are incompatible with freedom values in education, but certain kinds of control or management, it follows that the two emphases in current educational thought are not incompatible, at least not in principle.

It is significant, however, that in almost every case where some psychological theory has shown itself to be incompatible with freedom values it has turned out that behind the claim was not some piece of empirical research, but instead a rather strict and demanding empiricist philosophy. Perhaps, then, the chief moral of this work is that if we wish to conduct serious research on how to achieve our ideals without at the same time adopting research strategies which distort these ideals, we would do well to adopt a philosophy of educational research which embodied a somewhat more modest and, thus, a more neutral empiricism.

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FOOTNOTES

1. B. F. Skinner, Walden Two, (New York: MacMillan, 1962), p. 257.
2. B. F. Skinner, Beyond Freedom and Dignity, (New York, Alfred A. Knopf, 1971), p. 14.
3. B. F. Skinner, Science and Human Behavior, (Free Press, September, 1966), pp. 447-448.
4. Ibid., pp. 6-7.
5. Ibid., pp. 30-31.
6. Lucretious, The Nature of the Universe, (Baltimore: Penguin Books, 1961), p. 67.
7. R. E. Hobart, "Free Will as Involving Determinism and Inconceivable without It," in Bernard Berofsky (ed.) Free Will and Determinism, (New York: Harper and Row, 1966), pp. 70-71.
8. A. I. Melden, Free Action, (London: Routledge & Kegan Paul, 1961), pp. 199-200.
9. Ibid., pp. 201-202.
10. A. R. Louch, Explanation and Human Action, (Berkeley: University of California Press, 1966), p. 51.
11. Roderick M. Chisholm, "Freedom and Action," in Keith Lehrer (ed.), Freedom and Determinism, (New York: Random House, 1966), p. 17.
12. Ibid., pp. 17-18.
13. Ibid., pp. 20-21.
14. Ibid., pp. 21-22.
15. Leonard I. Krimerman, "Autonomy: A New Paradigm for Research," in Dunkel, Gowin and Thomas, Philosophical Redirection of Educational Research, The Seventy-first Yearbook of the National Society for the Study of Education, (Chicago: University of Chicago Press, 1972), p. 4. (See footnote No. 4.)
16. Ibid., p. 328.
17. Ibid., p. 339.
18. Ibid., p. 334,335.
19. Irving Copi, Symbolic Logic, (New York: MacMillan, 1965), pp. 2,3.
20. Rudolf Carnap, Logical Foundations of Probability, (Chicago: University of Chicago Press, 1950), p. 39.
21. Ibid., p. 40.
22. Stephen Toulmin, The Uses of Argument, (Cambridge: Cambridge University Press, 1958), p. 8.
23. Jean Piaget, Psychology of Intelligence, (Patterson, New Jersey: Littlefield, Adams & Co., 1963), p. 33.
24. Gottlob Frege, Die Grundlagen Der Arithmetik, (Evanston, Illinois: Northwestern University Press, 1968), p. 13, 14.
25. Piaget, p. 29.
26. Skinner, Beyond Freedom, p. 94.

27. B. F. Skinner, Verbal Behavior, (New York: Appleton-Century-Crofts, 1957), p. 455.

28. P. C. Dodwell, "Is a Theory of Conceptual Development Necessary?" in Theodore Mischel, Cognitive Development and Epistemology, (New York: Academic Press, 1971), pp. 370,371.

29. Jean Piaget, Logic and Psychology, (New York: Basic Books, Inc., 1957), p. xvii.

30. Toulmin, pp. 5,6.

31. Noan Chomsky, Problems of Knowledge and Freedom, (New York: Random House, 1971), p. 9.

32. Hilary Putnam, "Minds and Machines," in A. R. Anderson, (ed.), Minds and Machines, (Englewood Cliffs, New Jersey: Prentice-Hall, 1964), pp. 84, 85.

33. Consider, for example, Descartes argument: "I then examined closely what I was, and saw that I could imagine that I had no body, and that there was no world nor any place that I occupied, but I could not imagine for a moment that I did not exist...therefore, I concluded that I was a substance whose whole essence or nature was only to think, and which, to exist, has no need of space or any material things. Thus it follows that this ego, this soul, by which I am what I am, is entirely distinct from the body..." Rene Descartes, Discourse on Method, Part IV.

34. The point of this perhaps overly criptic argument is that language, particularly the sort of language which includes a logical vocabulary, is conceptually essential to thinking. This is so for two reasons. First, if we are to call some process described in purely mechanical language a thought process, we can only do so because we have discovered that this physical process is also correctly described by a logical vocabulary in the way previously indicated. Thus, a logical description of thinking is conceptually prior to any possible mechanical description. Second, a condition of the occurrence of those physical processes called thoughts is that they have an intimate connection with language. Such processes could not occur unless the person in whom they occur had learned a language. Generally, it is a mistake to think of words as things which accidentally get attached to thought processes as though thoughts could occur without words although they can also be expressed by words. Thought processes are the instantiation of words and arguments. The possibility that they may be described in purely mechanical terms does not alter this.

35. Norman Malcolm, "Behaviorism as a Philosophy of of Psychology" in T. W. Wann (ed.), Behaviorism and Phenomenology, (Chicago: University of Chicago Press, 1964), p. 159.

36. B. F. Skinner, The Technology of Teaching, (New York: Appleton-Century-Crofts), pp. 119-120.

37. Ibid., p. 117.
38. J. Mark Ackerman, Operant Conditioning Techniques for the Classroom, (Glenview, Illinois: Scott, Foresman & Co., 1972), p. 9.
39. Paul Hirst, "Language and Thought," Proceedings of the Annual Conference, (London: Philosophy of Education Society of Great Britain, 1966), pp. 70,71.
40. Ibid., p. 64.
41. Ludwig Wittgenstein, Philosophical Investigations, (New York: MacMillan, 1965), p. 194.
42. Paul Ziff, Understanding Understanding, (Ithaca, N.Y.: Cornell University Press, 1972), p. 104.
43. Skinner, Verbal Behavior, p. 422.
44. Ibid., pp. 6,7.
45. Skinner, Science and Human Behavior, p. 247.
46. Ibid., p. 249.
47. Ibid., p. 250.
48. Skinner, Verbal Behavior, p. 313.
49. Noam Chomsky, "A Review of B.F. Skinner's Verbal Behavior," in Foda and Katz (eds.) The Structure of Language, (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1964), p. 574.
50. Ibid., p. 553.
51. Skinner, Verbal Behavior, p. 454.
52. Ibid., p. 455.
53. Ibid.
54. Ibid.
55. Irving Maltyman, "Thinking from a Behaviorist Point of View," in John P. De Cecco (ed.), The Psychology of Language, Thought, and Instruction, (New York: Holt, Rinehart and Winston, 1967), p. 234.
56. Ibid., pp. 235,236.
57. D. E. Berlyne, "Knowledge and Stimulus-Response Psychology" in Anderson and Ausebel (eds.), Readings in the Psychology of Cognition, (New York: Holt, Rinehart and Winston, 1965), pp. 44,45.
58. Ibid., p. 45.
59. Skinner, Verbal Behavior, pp. 6,7.
60. Ibid., p. 6.
61. Skinner, Science and Human Behavior, p. 257.
62. John Stuart Mill, On Liberty, (New York: Bobbs-Merrill, 1956), pp. 71, 72.
63. Jerome Bruner, "The Art of Discovery," in Anderson and Ausubel, p. 618.
64. Skinner, Science and Human Behavior, p. 84.
65. Skinner, Verbal Behavior, p. 455.
66. Jerome Bruner, The Relevance of Education, (New York: W. W. Norton & Co., Inc., 1971), p. 111.
67. Ibid.
68. Skinner, Beyond Freedom, pp. 97-99, 125.
69. Ibid., p. 41.
70. Mill, p. 3.

71. Ibid., p. 64.
72. Skinner, Walden Two, p. 262.
73. Ibid., p. 263.
74. Immanuel Kant, Groundwork of the Metaphysic of Morals, (New York: Harper & Row, 1964), p. 96.
75. Ibid.
76. Leon Lessinger, Every Kid a Winner: Accountability in Education, (New York: Simon and Schuster, 1970), p. 5. (My Italics)
77. Ibid., p. 6.
78. Robert Mager, Preparing Instructional Objectives, (Belmont, California: Fearon Publishers, 1962), p. 3.
79. Ibid., p. 11.
80. Ibid., p. 15.
81. Lessinger, pp. 85,86.

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